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SUBJECT FIELD AND GROUP STRUCTURE

(Use Edge Index on back cover to locate subject field in the journal)

FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft; Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES. Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology; Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings, Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection; Communications; Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

REPORTS & TRANSLATIONS

1. AERONAUTICS

1A. Aerodynamics

AD-768 557/1GA PC$3.25/MF$1.45
California Inst of Tech Pasadena
AXIAL FLOW IN LAMINAR TRAILING VORTICES,
D. W. Moore, and P. G. Saffman. 22 Nov 72, 2p
AFOSR-TR-73-1931
Grant AF-AFOSR-2092-71
Availability: Pub. in the Proceedings of the Royal Society London A, v333 p491-508 1973.

Descriptors: (*Jet planes, Wake), Vortices, Laminar flow, Turbulence, Viscosity, Equations of motion.

The structure of laminar trailing vortices behind a lifting wing is considered. The inviscid roll up of the trailing vortex sheet is examined, and the nature of the singularity at the centre of the spiral is determined. It is shown that viscosity removes the singularity and the structure of the viscous core is obtained. The pressure in the viscous core is found and used to calculate the axial velocities produced by streamwise pressure gradients. It is found that the perturbation of axial velocity can be either away from the wing or towards the wing depending on the distribution of tip loading on the wing. For elliptic loading, the perturbation is towards the wing. The axial flow deficit in the core due to the boundary layers on the wing is also estimated. A comparison with experiment is made and reasonable agreement is found. (Author)

AD-768 797/3GA PC$3.50/MF$1.45
Pennsylvania State Univ University Park Dept of Aerospace Engineering
AN ANALYTICAL AND EXPERIMENTAL STUDY OF FARFIELD ROTOR WAKE GEOMETRY AND VELOCITY.
Master's thesis,
Thomas Alan Egolf. Aug 73, 75p Rept no. PSU-Aersp-73-7 AROD-9334:3-E
Grants DA-ARO-D-31-124-71-G13, DA-ARO-D-31-124-73-G36

Descriptors: (*Rotor blades(Rotary wings), Vortices), (*Helicopter rotors, Wake), Flow fields, Drag, Airfoils, Fluid dynamic properties, Theses, Numerical analysis.
Identifiers: Vortex shedding.

All fixed wing aircraft generate trailing vortex wakes whose circulatory strength is dependent on flight conditions and aircraft geometry. A rotor also generates a vortex wake. A vortex sheet is shed from each blade. Each sheet rolls up rapidly outboard to form a tip vortex. The purpose of the study reported here is to estimate the rotor wake geometry and velocity field downstream of the rotor for the particular case where the rotor wake exhibits strong similarities to the fixed wing wake. A method is developed by which the helicopter far field wake can be readily compared to the far field wake generated by an equivalent wing. (Author)

AD-768 988/8GA PC$3.50/MF$1.45
Advanced Technology Labs., Inc., Westbury, N.Y.
SIMILARITY PARAMETERS AND THEIR SENSITIVITY FOR TRANSONIC AIRFRAME EXHAUST NOZZLE INTERACTIONS.
Technical rept. 24 Jan-25 Sep 72,
Gerald Roffe, and Gabriel Miller. Jan 73, 75p Rept no. ATL-TR-175 AFFDL-TR-73-9
Contract F33615-72-C-1362

Descriptors: (*Exhaust gases, Interactions), (*Airframes, Transonic flow), Flow fields, Flow separation, Transonic characteristics, Axially symmetric flow, Nozzle gas flow, Numerical analysis, Wind tunnel models.
Identifiers: Similarity theory.

A qualitative description of the fluid mechanics of transonic airframe interaction with engine exhaust flows is formulated and used to derive the pertinent similarity parameters of the problem. The sensitivity of the flow field to these parameters is explored by computations and analysis of available data and leads to the conclusion that viscous parameters such as boundary layer momentum thickness, engine exit flow profiles and mass flux ratio have a pronounced effect on simulation capability. Based on the findings of the similarity and sensitivity studies, experiments are outlined for both continuous and blowdown facilities to investigate the role of viscous parameters more fully. (Author)

JPRS-60353/GA PC$2.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
COMPUTATION OF THE AERODYNAMIC CHARACTERISTICS OF A RECTANGULAR WING WITH PLATES MOVING AT LOW SUBSONIC SPEED NEAR A SCREEN,
S. D. Ermolenko, Yu. A. Rogozin, and C. V. Rogachev. 24 Oct 73, 11p
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Aviatsionnaya Tekhnika (USSR) n3 p105-112 1972.

Descriptors: (*Thin wings, *Subsonic characteristics), USSR, Rectangular bodies, Computation, Angle of attack, Computer programming, Eddies, Translations.
Identifiers: Screens.

The aerodynamic characteristics are computed of a thin rectangular wing with rectangular end plates in an ideal incompressible flow, at an angle of attack .

N73-29993/5GA PC$4.25
National Aeronautics and Space Administration, Washington, D.C.
AERONAUTICAL ENGINEERING: A SPECIAL BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 32, JUNE 1973.
Jun 73, 116p NASA-SP-7037(32)

Descriptors: *Aerodynamics, *Aeronautical engineering, *Bibliographies, Aeronautics, Aircraft design, Aircraft engines, Ground support equipment.

For abstract, see STAR 1121

N73-29994/3GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EFFECT OF NOZZLE LATERAL SPACING, ENGINE INTERFAIRING SHAPE, AND ANGLE OF ATTACK ON THE PERFORMANCE OF A TWIN-JET AFTERBODY MODEL WITH CONE PLUG NOZZLES.
B. L. Berrier. Aug 73, 143p NASA-TM-X-2724, L-8690

Descriptors: *Aerodynamic configurations, *Afterbodies, *Conical nozzles, *Plug nozzles, *Tail assemblies, Aerodynamic characteristics, Angle of attack, Jet engines, Performance tests.

For abstract, see STAR 1121

N73-29996/8GA PC$3.75/MF$1.45
Bell Helicopter Co., Fort Worth, Tex.
AN EXPERIMENTAL INVESTIGATION OF VORTEX STABILITY, TIP SHAPES, COMPRESSIBILITY, AND NOISE FOR HOVERING MODEL ROTORS.
Final Report.
J. L. Tangler, R. M. Wohlfeld, and S. J. Miley. Sep 73, 85p NASA-CR-2305, BELL-299-099-641
Contract NAS1-10946

Descriptors: *Flow visualization, *Hot-wire anemometers, *Propellers, *Rotary wings, *Schlieren photography, *Turbulent wakes, Flow characteristics, Shock waves, Vortices.

For abstract, see STAR 1121

N73-29997/6GA PC$4.00/MF$1.45
Southampton Univ. (England). Dept. of Aeronautics and Astronautics.
ON THE DESIGN CONDITIONS OF A CARET WING.
D. Liu. Apr 73, 38p AASU-327

Descriptors: *Caret wings, *Flow distribution, *Three dimensional flow, *Two dimensional flow, Aerodynamic configurations, Mach cones.

For abstract, see STAR 1121

N73-29999/2GA PC$3.75/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany). Inst. fuer Aeroelastik.
AUXILIARY FUNCTIONS OF THE THEORY OF THE OSCILLATING LIFTING SURFACE WITH LARGE ASPECT RATIO FOR MACH NUMBERS BETWEEN 0 AND 1. PART 1: ANALYTICAL REPRESENTATION HILFSFUNKTIONEN ZUR THEORIE DER SCHWINGENDEN TRAGFLAECHE GROSSER STRECKUNG IM BEREICH DER MACH'SCHEN ZAHLEN 0 BIS 1. TEIL 1: ANALYTISCHE DARSTELLUNG.
H. Kuessner. 1973, 32p DLR-FB-73-16, AVA-FB-7227
In German; English Summary.

Descriptors: *High aspect ratio, *Lifting bodies, *Wing oscillations, Downwash, Integral equations, Pressure distribution, Subsonic speed, Surfaces.

For abstract, see STAR 1121

N73-30001/4GA PC$3.75/MF$1.45
Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.
THE LOAD NEAR THE APEX OF A LIFTING SWEPT WING IN LINEARISED SUBSONIC FLOW.
P. J. Davies. 1972, 32p ARC-R/M-3716, RAE-TR-72031
Misc-Supersedes Rae-TR-72031; Arc-33584.

Descriptors: *Apexes, *Lift devices, *Subsonic flow, *Swept wings, *Wing loading, Eigenvectors, Linearity, Singularity (Mathematics).

For abstract, see STAR 1121

N73-30002/2GA PC$4.00/MF$1.45
Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.
AN EXACT TEST CASE FOR THE PLANE POTENTIAL FLOW ABOUT TWO ADJACENT LIFTING AEROFOILS.
B. R. Williams. 1973, 38p ARC-R/M-3717, RAE-TR-71197
Misc-Supersedes Rae-TR-71197; Arc-33661.

Descriptors: *Airfoils, *Circles (Geometry), *Conformal mapping, *Potential flow, *Transformations (Mathematics), Incompressible flow, Lift devices, Numerical analysis.

For abstract, see STAR 1121

N73-30003/0GA PC$5.25/MF$1.45
Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.
AN ANALYSIS OF THE DRAG OF TWO ANNULAR AEROFOILS.
C. Young. 1973, 61p ARC-R/M-2718, RAE-TR-71126
Misc-Supersedes Rae-TR-71126; Arc-33662.

Descriptors: *Airfoils, *Drag measurement, *Incompressible flow, *Pressure measurements, Annuli, Cowlings, Flow distribution, Pressure distribution, Subsonic wind tunnels, Supersonic flow, Wind tunnel tests.

For abstract, see STAR 1121

N73-30004/8GA PC$3.75/MF$1.45
Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.
AN INTERATIVE METHOD FOR CALCULATION OF THE LOADING ON A THIN UNSWEPT WING.
C. C. L. Sells. 1973, 33p ARC-R/M-3719, RAE-TR-72009
Misc-Supersedes Rae-TR-72009; Arc-33585.

Descriptors: *Rectangular wings, *Thin wings, *Wing loading, Computer programs, Convergence, Downwash.

For abstract, see STAR 1121

N73-30005/5GA PC$4.50/MF$1.45
Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.
AN EXPERIMENTAL INVESTIGATION OF THE SUBSONIC LONGITUDINAL CHARACTERISTICS OF FIVE SLENDER-WING MODELS WITH GOTHIC PLANFORMS.
D. L. I. Kirkpatrick, and D. A. Kirby. 1973, 48p ARC-R/M-3720, RAE-TR-71137
Misc-Supersedes Rae-TR-71137; Arc-33473.

Descriptors: *Drag measurement, *Lift, *Pitching moments, *Slender wings, Low aspect ratio, Subsonic speed, Wind tunnel tests, Wing planforms.

For abstract, see STAR 1121

N73-30006/3GA PC$4.25/MF$1.45
Saab-Scania, Linkoping (Sweden). Aerospace Div.
APPLICATON OF THE POLAR COORDINATE METHOD TO OSCILLATING WING CONFIGURATIONS.
V. J. E. Stark. Mar 73, 45p SAAB-L-0-R64

Descriptors: *Aerodynamic configurations, *Computer programming, *Polar coordinates, *Wing loading, *Wing oscillations, Aerodynamic coefficients, Control surfaces, Flow distribution, Quadratures, Subsonic flow, Velocity distribution.

For abstract, see STAR 1121

N73-30013/9GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EXPERIMENTAL AND ANALYTICAL DETERMINATION OF STABILITY PARAMETERS FOR A BALLOON TETHERED IN A WIND.
L. T. Redd, R. M. Bennett, and S. R. Bland. Sep 73, 57p NASA-TN-D-7222, L-8524

Descriptors: *Aerodynamic characteristics, *Balloons, *Stability derivatives, *Wind (Meteorology), Aerodynamic coefficients, Inflatable structures, Numerical analysis.

For abstract, see STAR 1121

N73-30015/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ACOUSTIC INVESTIGATION OF THE ENGINE-OVER-THE-WING CONCEPT USING A D-SHAPED NOZZLE.
M. Reshotko, and R. Friedman. 1973, 18p NASA-TM-X-71419
Conf-Proposed for Presentation at AERO-Acoustic Specialists Conf., Seattle, Wash., 15-17 Oct. 1973; Sponsored by Aiaa.

Descriptors: *Acoustic properties, *Aerodynamic characteristics, *Aerodynamic configurations, *Aircraft noise, *Engine noise, *Externally blown flaps, Acoustic measurements, Flow distribution, Nozzle flow, Pressure distribution.

For abstract, see STAR 1121

N73-30027/9GA PC$9.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
ON THE PITCH DAMPING MOMENT IN HOVERING OF A RIGID HELICOPTER ROTOR.
K. Takasawa. Sep 73, 143p NASA-TT-F-15010, NAL-TR-256
Contract NASW-2481
Tran-Transl. Into English from Kogyo Gijutsuin, Hakko Kenkyusho Kenkyu Hokoku (Tokyo), Nal TR-256, Nov. 1971 80 p.

Descriptors: *Damping, *Hovering stability, *Pitch (Inclination), *Pitching moments, *Rotary wings, *Stability derivatives, Aerodynamic characteristics, Flow visualization, Numerical analysis, Turbulent flow.

For abstract, see STAR 1121

N73-30035/2GA PC$6.25/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany). Inst. fuer Aeroelastik.
DYNAMIC AND AEROELASTIC PROBLEMS OF STOP-ROTORS AND THEIR ANALYTICAL TREATMENT. PART 2: DETAILS OF ANALYTICAL SOLUTION DYNAMISCHE UND AEROELASTISCHE PROBLEME DES STOP-ROTORS UND IHRE ANALYTISCHE BEHANDLUNG. TEIL 2: ANALYTISCHE ANSAETZE UND LOESUNGSVERFAHREN.
H. Foersching. 17 Jan 73, 82p DLR-FB-73-19, AVA-FB-7229
In German; English Summary.

Descriptors: *Aeroelasticity, *Dynamic response, *Folding structures, *Rotor blades, *V/stol aircraft, Aerodynamic forces, Flutter analysis, Gust loads, Lifting rotors, Torsional vibration.

For abstract, see STAR 1121

N73-30036/0GA PC$5.25/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands).
BEHAVIOR OF VERY LARGE AIRCRAFT DISTURBED BY WIND SHEAR AND ATMOSPHERIC TURBULENCE.
W. P. Deboer. 10 Feb 72, 61p NLR-TR-72023-U

Descriptors: *Aircraft performance, *Altitude control, *Atmospheric turbulence, *Wind shear, Aircraft control, Aircraft landing, Airspeed, Approach control, Stability derivatives.

For abstract, see STAR 1121

N73-30244/0GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
LASER DOPPLER VELOCIMETER INVESTIGATION OF TRAILING VORTICES BEHIND A SEMI-SPAN SWEPT WING IN A LANDING CONFIGURATION.
D. L. Ciffone, K. L. Orloff, and G. R. Grant. Aug 73, 45p NASA-TM-X-62294

Descriptors: *Cv-990 aircraft, *Doppler effect, *Turbulent wakes, *Vortices, *Wind tunnel tests, Aerodynamic characteristics, Aerodynamic coefficients, Test equipment.

For abstract, see STAR 1121

N73-30864/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
STATUS OF TWO STUDIES ON ACTIVE CONTROL OF AEROELASTIC RESPONSE.
I. Abel, and M. C. Sandford. Sep 73, 29p NASA-TM-X-2909, L-9251

Descriptors: *Aircraft control, *B-52 aircraft, *Flight control, *Flutter analysis, Aerodynamic characteristics, Aircraft stability, Transonic speed, Wind tunnel tests.

For abstract, see STAR 1121

N73-30926/2GA PC$3.50/MF$1.45
Wisconsin Univ., Milwaukee.
FINITE ELEMENT ANALYSIS AND COMPUTER GRAPHICS VISUALIZATION OF FLOW AROUND PITCHING AND PLUNGING AIRFOILS.
T. Bratanow, and A. Ecer. Sep 73, 72p NASA-CR-2249
Contract NGR-50-007-001

Descriptors: *Air flow, *Airfoils, *Finite element method, *Flow characteristics, *Flow visualization, Computer graphics, Computer programs, Incompressible flow, Navier-stokes equation.

For abstract, see STAR 1122

N73-30927/0GA PC$4.50/MF$1.45
Creare, Inc., Hanover, N.H.
PRESSURE RECOVERY PERFORMANCE OF CONICAL DIFFUSERS AT HIGH SUBSONIC MACH NUMBERS.
F. X. Dolan, and P. W. Runstadler, Jr.. Jul 73, 146p NASA-CR-2299, TN-165
Contract NAS3-15331

Descriptors: *Conical flow, *Diffusers, *Flow characteristics, *Inlet flow, *Pressure recovery, *Subsonic flow, Aerodynamic configurations, Flow equations, Pressure distribution.

For abstract, see STAR 1122

N73-30928/8GA PC$3.50/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
STUDY OF THE FLOW AROUND SHARP-EDGED SLENDER DELTA WINGS WITH LARGE ANGLES OF ATTACK.
D. Hummel. Sep 73, 29p NASA-TT-F-15107
Contract NASW-2483
Tran-Transl. Into English from Z. Flugwiss. (W. Germany), V. 15, Oct. 1967 p 376-385. Conf-Presented at the 10TH Meeting for the Aerodynamic Group of the Wglr, Munich, 8 Dec. 1966.

Descriptors: *Aerodynamic characteristics, *Delta wings, *Flow characteristics, *Slender wings, Aerodynamic configurations, Angle of attack, Wind tunnel tests.

For abstract, see STAR 1122

N73-30929/6GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
LOW-SPEED AERODYNAMIC CHARACTERISTICS OF AN AIRFOIL OPTIMIZED FOR MAXIMUM LIFT COEFFICIENT.
G. J. Bingham, and A. W. Chen. Dec 72, 54p NASA-TN-D-7071, L-8491

Descriptors: *Aerodynamic coefficients, *Airfoils, *Lift, *Subsonic speed, *Wind tunnel tests, Aerodynamic characteristics, Aerodynamic configurations, Pressure distribution.

For abstract, see STAR 1122

N73-30930/4GA PC$4.75/MF$1.45
Bolt, Beranek, and Newman, Inc., Canoga Park, Calif.
A STUDY OF TRAILING EDGE BLOWING AS A MEANS OF REDUCING NOISE GENERATED BY THE INTERACTION OF FLOW WITH A SURFACE.
T. D. Scharton, B. Pinkel, and J. F. Wilby. 28 Sep 73, 54p NASA-CR-132270, BBN-2593
Contract NAS1-9559

Descriptors: *Aerodynamic noise, *Externally blown flaps, *Flow distribution, *Jet mixing flow, *Noise reduction, *Pressure distribution, Air flow, Cavitation flow, Jet impingement.

For abstract, see STAR 1122

N73-30932/0GA PC$5.00/MF$1.45
Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.
THE CALCULATED GROWTH OF LIFT AND MOMENT ON A SWEPT WING ENTERING A DISCRETE VERTICAL GUST AT SUBSONIC SPEEDS.
H. C. Garner. 1973, 58p ARC-CP-1241, RAE-TR-72010
Misc-Supersedes Rae-TR-72010; Arc-33854.

Descriptors: *Gusts, *Integral transformations, *Lift, *Piston theory, *Pitching moments, *Swept wings, Aerodynamic forces, Sine waves, Subsonic speed, Unsteady state, Vertical air currents, Wing loading.

For abstract, see STAR 1122

N73-30933/8GA PC$5.50/MF$1.45
Royal Aircraft Establishment, Bedford (England). Aerodynamics Dept.
MEASUREMENT OF THE INTERNAL PERFORMANCE OF A RECTANGULAR AIR INTAKE HAVING VARIABLE GEOMETRY COMPRESSION SURFACES AT MACH NUMBERS FROM 1.7 TO 2.5 PART 2: THE EFFECT OF INCIDENCE.
C. S. Brown, and E. L. Goldsmith. 1973, 67p ARC-CP-1242

Descriptors: *Internal compression inlets, *Performance tests, *Supersonic inlets, *Variable geometry structures, Incidence, Mass flow, Pressure recovery, Rectangles, Shock wave profiles, Supersonic wind tunnels, Wind tunnel tests.

For abstract, see STAR 1122

N73-30934/6GA PC$5.75/MF$1.45
Royal Aircraft Establishment, Bedford (England). Aerodynamics Dept.
MEASUREMENT OF THE INTERNAL PERFORMANCE OF A RECTANGULAR AIR INTAKE WITH VARIABLE GEOMETRY AT MACH NUMBERS FROM 1.7 TO 2.5, PART 1.
C. S. Brown, and E. L. Goldsmith. 1973, 71p ARC-CP-1243-PT-1, RAE-TR-71159
Misc-Supersedes Rae-TR-71159; Arc-33681.

Descriptors: *Internal compression inlets, *Performance tests, *Supersonic inlets, *Variable geometry structures, Mass flow, Pressure recovery, Rectangles, Shock wave profiles, Supersonic wind tunnels, Wind tunnel tests.

For abstract, see STAR 1122

N73-30935/3GA PC$8.75/MF$1.45
Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.
THE LIFT AND STALLING CHARACTERISTICS OF A 35 DEG SWEPT BACK WING DESIGNED TO HAVE IDENTICAL CHORDWISE PRESSURE DISTRIBUTIONS AT ALL SPANWISE STATIONS WHEN NEAR MAXIMUM LIFT.
D. S. Woodward, and D. E. Lean. 1973, 135p ARC-R/M-3721, RAE-TR-71050
Misc-Supersedes Rae-TR-71050; Arc-33417.

Descriptors: *Aerodynamic stalling, *Lift, *Pressure distribution, *Sweptback wings, *Wing loading, Aerodynamic configurations, High aspect ratio, Three dimensional flow, Two dimensional flow.

For abstract, see STAR 1122

N73-30939/5GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
LOW-SPEED AERODYNAMIC CHARACTERISTICS OF A FUSELAGE MODEL WITH VARIOUS ARRANGEMENTS OF ELONGATED LIFT JETS.
R. D. Vogler, and K. W. Goodson. Aug 73, 86p NASA-TN-D-7299, L-8753

Descriptors: *Aerodynamic characteristics, *Ground effect, *Lift augmentation, *Nozzle flow, *V/stol aircraft, Jet flow, Jet nozzles, Lift augmentation.

For abstract, see STAR 1122

N73-30940/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
COMPARISONS OF PREDICTIONS OF THE XB-70-1 LONGITUDINAL STABILITY AND CONTROL DERIVATIVES WITH FLIGHT RESULTS FOR SIX FLIGHT CONDITIONS.
C. H. Wolowicz, and R. B. Yancey. Aug 73, 44p NASA-TM-X-2881, H-773

Descriptors: *Aircraft control, *Aircraft performance, *Aircraft stability, *B-70 aircraft, Data acquisition, Flight tests, Performance prediction.

For abstract, see STAR 1122

N73-30944/5GA PC$4.25/MF$1.45
National Research Council of Canada, Ottawa (Ontario). Unsteady Aerodynamics Lab.
SUPERSONIC EXPERIMENTS ON DYNAMIC CROSS-DERIVATIVES DUE TO PITCHING AND YAWING OF AIRCRAFT-LIKE VEHICLES.
K. J. Orlik-ruckemann, J. G. Laberge, and E. S. Hanff. Aug 73, 45p NASA-CR-114663, LTR-UA-24
Contract NASW-2369

Descriptors: *Pitching moments, *Wind tunnel apparatus, *Wind tunnel models, *Yawing moments, Aerodynamic coefficients, Angle of attack, Sideslip.

For abstract, see STAR 1122

N73-30949/4GA PC$15.25/MF$1.45
Bell Helicopter Co., Fort Worth, Tex.
V/STOL TILT ROTOR STUDY. VOLUME 5: A MATHEMATICAL MODEL FOR REAL TIME FLIGHT SIMULATION OF THE BELL MODEL 301 TILT ROTOR RESEARCH AIRCRAFT.
P. B. Harendra, M. J. Joglekar, T. M. Gaffey, and R. L. Marr. 13 Apr 73, 265p NASA-CR-114614, BELL-301-099-001-VOL-5
Contract NAS2-6599

Descriptors: *Aerodynamic characteristics, *Aerodynamic configurations, *Aircraft design, *Tilting rotors, Flight simulation, Mathematical models, Numerical analysis, Real time operation.

For abstract, see STAR 1122

N73-30950/2GA PC$18.50/MF$1.45
Bell Helicopter Co., Fort Worth, Tex.
V/STOL TILT ROTOR STUDY. VOLUME 6: HOVER, LOW SPEED AND CONVERSION TESTS OF A TILT ROTOR AEROELASTIC MODEL (MODEL 300).
R. L. Marr, K. W. Sambell, and G. T. Neal. 15 May 73, 326p NASA-CR-114615, BELL-301-099-002-VOL-6
Contract NAS2-6599

Descriptors: *Aerodynamic configurations, *Aircraft control, *Aircraft stability, *Rotary wings, *Tilting rotors, *V/stol aircraft, Data acquisition, Performance tests, Test facilities, Wind tunnel tests.

For abstract, see STAR 1122

N73-30951/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EFFECT OF REYNOLDS NUMBER AND ENGINE NACELLES ON THE STALLING CHARACTERISTICS OF A MODEL OF A TWIN-ENGINE LIGHT AIRPLANE.
V. E. Lockwood. Dec 72, 36p NASA-TN-D-7109, L-8591

Descriptors: *Aerodynamic characteristics, *Light aircraft, *Wind tunnel models, *Wind tunnel tests, Aerodynamic configurations, Directional stability, Lateral stability, Longitudinal stability.

For abstract, see STAR 1122

N73-30954/4GA PC$8.50/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany). Inst. fuer Aeroelastik.
AIRCRAFT FLUTTER SIMULATION BY MEANS OF THE ELECTRONIC ANALOG COMPUTER WITH SPECIAL REGARD TO STRUCTURAL NONLINEARITIES.
Ph.D. Thesis - Tech. Univ. Brunswick.
E. Breitbach. 24 Jan 73, 129p DLR-FB-73-30, AVA-FB-7228
In German; English Summary.

Descriptors: *Analog simulation, *Flight simulation, *Flutter analysis, Aerodynamic forces, Aeroelasticity, Aircraft stability, Aircraft structures, Nonlinearity, Real time operation, Springs (Elastic).

For abstract, see STAR 1122

N73-30955/1GA PC$3.50/MF$1.45
Royal Aircraft Establishment, Farnborough (England). Structures Dept.
COMPARATIVE TURBULENCE FOR A CANBERRA AND A VULCAN FLYING TOGETHER AT LOW ALTITUDE.
J. K. Curran. 1973, 26p ARC-CP-1244, RAE-TR-71100
Misc-Supersedes Rae-TR-71100; Arc-33862.

Descriptors: *Canberra aircraft, *Gust loads, *Low level turbulence, *Power spectra, *Vulcan aircraft, Acceleration (Physics), Low altitude, Wing loading, Wing roots.

For abstract, see STAR 1122

1B. Aeronautics

AD-768 582/9GA Reprint
Rockwell International Corp Thousand Oaks Calif Science Center
A NEW AREA RULE FOR HYPERSONIC WING-BODIES,
N. Malmuth. 16 Aug 71, 5p AFOSR-TR-73-1937
Contract F44620-71-C-0021
Revision of report dated 1 Jun 71.
Availability: Pub. in AIAA Jnl., v9 n12 p2460-2462 Dec 71.

Descriptors: (*Wing-body configurations, Hypersonic characteristics), Conical bodies, Delta

wings, Hypersonic flow, Lift, Drag, Reduction, Flow fields.

In the Prandtl-Glauert regime, the effect of wing-body interference on over-all forces can be obtained from area rules which eliminate the need for the knowledge of the details of the local flowfield for a wide class of practically interesting configurations. Ladyzhenskii has developed an analogous theorem in the hypersonic range for wave drag of blunt-nosed bodies at zero incidence. There are apparently no corresponding results for the hypersonic lift of pointed, three-dimensional shapes. In the report, an area rule is obtained for the change in the lift to drag ratio of a hypersonic delta wing due to the addition on its compressive side of a conical body of arbitrary cross section. A hypersonic area rule has been derived, which states that the change in aerodynamic efficiency of a hypersonic delta wing due to body addition within the previous class of limiting flows and assumptions, is directly proportional to the body volume and independent of its cross-sectional shape. (Author)

AD-768 845/0GA PC$2.75/MF$1.45
Federal Aviation Administration Washington D C Systems Research and Development Service
INTERRELATIONSHIP OF FAA-DOT-NASA PROGRAMS RELATING TO AIRCRAFT CABIN MATERIALS FIRE.
Status rept.,
Colin G. Simpson. Sep 73, 21p* Rept no. FAA-RD-73-146

Descriptors: (*Aircraft cabins, Materials), (*Aircraft fires, Aircraft cabins), Fire safety, Flammability, Gases, Toxicity, Hazards, Smokes, Aircraft equipment, Fire extinguishers.

Aircraft cabin materials fire hazards consisting of flammability, smoke emission, toxic gas emission and flash fire are discussed together with the work ongoing pertinent to these hazards by the FAA and other DOT Administrations and the NASA. (Modified author abstracts)

AD-768 846/8GA PC$2.75/MF$1.45
Federal Aviation Administration Washington D C Systems Research and Development Service
USER'S MANUAL FOR THE LOS ANGELES BASIN STANDARD TRAFFIC MODEL (CARD DECK/CHARACTER TAPE VERSION).
Final rept.,
Mark Hildenberger. May 73, 16p Rept no. FAA-RD-73-89

Descriptors: (*Air traffic, California), Instruction manuals, Reviews, Data.
Identifiers: 1982 Los Angeles Basin Standard Traffic Model.

The document is directed toward the users of the 1982 Los Angeles Basin Standard Traffic Model data. Precise descriptions of the recorded information fields and their corresponding formats are given. Also included are the complete lists of the 25 major-size airports investigated and the 73 distinct aircraft types simulated. (Modified author abstract)

AD-768 849/2GA PC$3.00/MF$1.45
Technology Inc San Antonio Tex Life Sciences Div
DEVELOPMENT OF VISUAL AIDS TO ALLEVIATE SPATIAL DISORIENTATION DURING TAKEOFF AND LANDING.
Final rept.,
W. H. Bowie, S. C. Collyer, and D. S. Stolarski.
Jun 73, 47p* FAA-RD-73-26
Contract DOT-FA72WA-2760

Descriptors: (*Space perception, *Pilots), (*Visual acuity, *Approach), (*Marker lights, *Aviation safety), Take-off, Aircraft landings, Hazards, Reliability(Electronics), Runways.
Identifiers: *Visual aids, Visibility markers.

The concept for a ground based visual aid to help alleviate spatial disorientation during takeoff and landing approaches has been developed. The proposed device consists of a 2/3 mile diameter circle of 12 lights mounted at least two miles from the end of the runway. This array has the appearance of a flat ellipse during most of the departure phase of flight. The relative degree of spatial disorientation hazard associated with a particular runway has been researched. A device has been designed and built with which to assess such hazards. The device is designated a visibility meter. In addition, a tentative design for visibility markers to aid in determining horizontal visibility was proposed. (Modified author abstract) Portions of this document are not fully legible.

AD-769 065/4GA PC$6.25/MF$1.45
LTV Aerospace Corp Dallas Tex Vought Systems Div
DEFINITION OF STUDY OBJECTIVES FOR INTEGRATED CREW MODULE DEVELOPMENT.
Final rept. 1 Jul 72-31 Aug 73,
E. R. Atkins, J. C. Hodges, T. L. Harper, J. R. Hanking, and A. A. Hall. Aug 73, 261p Rept no. 2-57110/3R-3104 JANAIR-730705
Contract N00014-72-C-0443

Descriptors: (*Jet fighters, *Escape systems(Aerospace)), (*Supersonic flight, Ejection), Flight crews, Protection, Survival, Performance tests, Positioning reactions, Human engineering, Acceleration tolerance, Anthropometry, Ejection seats.
Identifiers: Supine positioning, *Integrated crew modules, Inflight escape devices, Protective devices, Escape capsules.

The technical report presents the results of a study to identify and qualify objectives in development of the Integrated Crew Module Crew Station. Study efforts encompassed the man factor in addressing crew performance and the machine factor thru analysis of critical design factors such as anthropomentry, geometry, controls and displays, vision, and arrangement. A baseline configuration was developed from these studies. A significant portion of the investigation was devoted to supination of the aircrewman for acceleration tolerance improvement. (Modified author abstract)

N73-30028/7GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
METEOROLOGICAL SAFETY OF AIRCRAFT FLIGHTS.
K. Yankin. Sep 73, 13p NASA-TT-F-15069
Contract NASW-2481
Tran-Transl. Into English from Grazhdanskaya Aviats. (Moscow), No. 5, 1973 p 12-13.

Descriptors: *Flight hazards, *Flight safety, *Meteorological parameters, *Weather forecasting, Atmospheric physics, Meteorological charts, Navigation aids.

For abstract, see STAR 1121

PB-224 209/7GA PC$10.00/MF$1.45
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.
AIRCRAFT ACCIDENT REPORTS BRIEF FORMAT. U.S. CIVIL AVIATION, ISSUE NUMBER 1 OF 1973 ACCIDENTS. FILE NUMBERS: 3-0001 THRU 3-0519, AND 3-0521 THRU 3-0900.
10 Aug 73, 532p NTSB-BA-73-8
Also available on subscription, $20.00/year domestic, $25.00/year foreign.

Descriptors: (*Aviation accidents, Statistical data), (*Civil aviation, *Accident investigations), Collision research, Licenses, Injuries, Death, Damage, Aircraft fires, Aircraft crashes.

The publication contains selected aircraft accident reports, in brief format, occurring in U.S. Civil Aviation operations during calendar year 1973. The 899 General Aviation accidents represent a random selection. The publication is issued irregularly, normally six times each year. The brief format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additional statistical information is tabulated by type of accident, phase of operation, kind of flying, injury index, aircraft damage, conditions of light, pilot certificate, injuries, and causal factors.

1C. Aircraft

AD-768 389/9GA PC$3.75/MF$1.45
Aeronautical Systems Div Wright-Patterson AFB Ohio Deputy for Engineering
AIR CARGO RESTRAINT CRITERIA.
Final rept.,
Joseph L. Weingarten, Charles V. Mayrand, and George E. Muller. Apr 73, 89p ASD-TR-73-17

Descriptors: (*Detents, Design), (*Transport planes, Cargo), (*Air Force operations, *Air transportation), Aviation accidents, Aviation safety, Specifications, Costs, Airframes, Impact shock, Jet transport planes.
Identifiers: C-130 aircraft, C-141 aircraft, Cargo restraint.

A major change in Air Force air cargo restraint criteria has been enacted. The revised criteria, which are based on technical report AFFDL-TR-71-139, Air Cargo Restraint Criteria, and their implementation are presented. An extract of AFFDL-TR-71-139 is included as Appendix I. The initial investigation was conducted to determine probabilities of encountering various forward crash load factors; to determine if cargo restraint procedures could be improved for better operational capability. Safety and cost factors were viewed in relation to current air transportability requirements. In determining the probabilities, data from January 1960 to Jul 1971, covering all major USAF cargo aircraft accidents with a total flying time in excess of 31 million hours, was used. The results showed that the risk to passengers on cargo flight is statistically rare and that a change in air cargo restraint procedures would provide a safety system than previously available with an overall cost savings to the military services. (Author)

AD-768 390/7GA PC$5.75/MF$1.45
Aeronautical Systems Div Wright-Patterson AFB Ohio Deputy for Engineering
COMPARISON OF THE FLYING QUALITIES OF THE A-7D AIRCRAFT WITH THE REQUIREMENTS OF MIL-F-8785B (ASG).
Technical rept. Mar-Dec 72,
Daryl J. Joseph. Apr 73, 233p ASD-TR-73-15

Descriptors: (*Jet fighters, Performance(Engineering)), Flight testing, Airframes, Flight control systems, Aerodynamic characteristics, Specifications.
Identifiers: A-7 aircraft, A-7D aircraft.

The report compares the flying qualities of the A-7D light attack airplane with the major flying qualities items of the Military Specification MIL-F-8785B(ASG). The comparison is based primarily on theoretical data supplemented as required by flight test data. The theoretical data is obtained from the contractor's report number 2-53320/8R-8089, dated 15 January 1968. The A-7D is aerodynamically the same as the A-7A; therefore, the A-7D estimated flying qualities are based on data obtained from flight tests of the A-7A airplane and A-7A model tests in the contractor's wind tunnel. (Author)

AD-768 420/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE EFFECT OF AIRPLANE PROPELLER ON A TUNNEL-TYPE SPRAYER,
Yu. G. Logachev, and E. S. Baryshev. 1 Oct 73, 18p Rept no. FTD-HT-23-857-73

Edited trans. of Mekhanika Protsessov Aviatsionnogo Opryskivaniya i Rasseivaniya Sypuchikh Veshchestv (USSR) v3 n219 p53-66 1971, by Kathleen L. Dion.

Descriptors: (*Sprays, Fluid dynamic properties), (*Propellers(Aerial), Spray nozzles), Aerodynamic characteristics, Angle of attack, Wind tunnel models, Stagnation point, Fluid flow, USSR.
Identifiers: Translations.

When the parameters of tunnel-type sprayers are calculated and selected, it is necessary to take into consideration the effect of the plane on the air streamlining of these sprayers. On a plane the greatest influence usually comes from the propeller. The report presents the results of experimental studies of this effect.

AD-768 457/4GA PC$3.75/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STUDY ON PANELS OF AIRCRAFT STRUCTURES UNDER REPEATED STATIC LOADS,
E. P. Obolenskii, and B. I. Sakharov. 9 Oct 73, 31p Rept no. FTD-HT-23-833-73
Edited trans. of Prochnost i Ustoichivost Tonkostennykh Aviatsionnykh Konstruktsii (USSR) v3 n180 p173-193 1971, by Marilyn Olaechea.

Descriptors: (*Airframes, Fatigue(Mechanics)), Stresses, Loading(Mechanics), Bending, Failure(Mechanics), Probability, Regression analysis, USSR.
Identifiers: Translations.

The brief conclusion drawn in the report concerning the effect of structural and technological factors on the durability of various structures are approximate and describe a structure only from the standpoint of applying variable loads of different magnitudes. For this reason further comprehensive studies are required. Nevertheless, the general regularities revealed in this article can be used in designing aircraft structures which are calculated for a long service life under variable loads.

AD-768 640/5GA Not available NTIS
Defence Standards Labs Maribyrnong (Australia)
CONSEQUENCES OF TINTING IN AIRCRAFT WINDSHIELDS,
Barry A. J. Clark. 5 Apr 71, 13p
Availability: Pub. in the American Industrial Hygiene Association Jnl., p611-623 Sep 72.

Descriptors: (*Windshields, Aircraft), (*Coloring, Windshields), Optical properties, Light transmission, Reflection, Visual acuity, Brightness, Human engineering, Night vision, Space perception, Performance tests, Adaptation(Physiology), Civil aviation, Australia.
Identifiers: Glare, Tinted windshields.

Optical properties are determined for samples of widely used light-absorbing windshields of civil aircraft. A literature survey indicates that (1) the light absorption has little effect on visual performance in daylight, but is hazardous in twilight and at night; (2) coloration may adversely affect signal perception in day and night conditions; (3) absorption of erythemal ultraviolet radiation is necessary, and, for near ultraviolet and infrared radiation, absorption is desirable. (Author)

AD-768 673/6GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
LDF POWERED BALLOON PROGRAM.
Instrumentation papers,
Arthur O. Koran, Richard C. Leclaire, and Catherine B. Rice. 18 Jul 73, 47p Rept nos. AFCRL-TR-73-0424, AFCRL-IP-198

Descriptors: (*Balloons, Propulsion), Propellers(Aerial), Power supplies, Flight paths, Balloon equipment, Aerial rudders, Wind, Flight testing.
Identifiers: Powered flight, Stationkeeping.

The report describes POBAL, a test flight to demonstrate the feasibility of accomplishing station-keeping by powering a 711,000-cu. ft. free balloon against the wind in the minimum wind field near 60,000-ft altitude. The propulsion system, fabricated from off the shelf components, incorporated a 35-ft diameter helicopter rotor and an 8-hp electric motor powered by Ag-Zn batteries. Line of thrust was controlled by a 9-ft high rudder, steerable either by radio command or by autopilot. POBAL was flown from Holloman AFB, New Mexico in September 1972. System components, flight results, recommendations and feasibility studies for a long duration POBAL system are discussed. (Author)

AD-768 755/1GA PC$2.75/MF$1.45
Naval Ordnance Lab White Oak Md
EFFECTS OF CANOPY GEOMETRY ON THE INFINITE MASS OPENING-SHOCK FACTOR OF A CROSS PARACHUTE WITH A W/L RATIO OF 0.264,
William P. Ludtke. 31 Jul 73, 20p Rept no. NOLTR-73-157

Descriptors: (*Parachutes, Shock(Mechanics)), Deployment, Parachute fabrics, Permeability, Cordage, Wind tunnel models.
Identifiers: Cross parachutes.

The effects of cloth permeability, number of suspension lines, and suspension line length on the infinite mass opening-shock factor of the cross parachute were investigated in a wind tunnel. Forty-inch-diameter models with a canopy arm-to-length ratio (W/L) of 0.264 were deployed at wind-tunnel velocities of 150 or 200 miles per hour. Results of these tests indicate that cloth permeability influences the infinite mass shock factor significantly. A decrease in the cloth permeability results in an increase in the shock factor. Suspension line length and number of suspension lines do not appreciably affect the shock factor. The steady-state drag coefficients are affected by the cloth and suspension line parameters. (Author)

AD-768 763/5GA PC$2.75/MF$1.45
Army Aviation Systems Command St Louis Mo
MAJOR ITEM SPECIAL STUDY (MISS), AH-1G DRIVESHAFT ASSEMBLY, MAIN.
Interim rept. 1 Jan 64-30 Jun 72.
Oct 73, 23p Rept no. USAAVSCOM-TR-73-26

Descriptors: (*Drive shafts, *Value engineering), Logistics, Quality control, Spare parts, Maintenance, Maintainability, Cost effectiveness, Malfunctions.
Identifiers: MISS(Major Item Special Studies), Major item special studies, Failure analysis, H-1 aircraft, AH-1G aircraft, Huey Cobra, Logistics management.

The report describes a failure analysis performed on a helicopter drive shaft assembly.

AD-768 764/3GA PC$3.00/MF$1.45
Army Aviation Systems Command St Louis Mo
MAJOR ITEM SPECIAL STUDY (MISS), AH-1G MAST ASSEMBLY.
Interim rept. Jan 64-Jun 72.
Oct 73, 32p Rept no. USAAVSCOM-TR-73-25

Descriptors: (*Antenna masts, *Value engineering), (*Helicopters, Antenna masts), Logistics, Quality control, Spare parts, Maintenance, Maintainability, Cost effectiveness, Malfunctions.
Identifiers: MISS(Major Item Special Studies), Major item special studies, Failure analysis, H-1 aircraft, AH-1G aircraft, Huey Cobra, Logistics management.

The report describes a failure analysis performed on a helicopter antenna mast assembly.

AD-768 769/2GA PC$3.50/MF$1.45
Army Materiel Systems Analysis Agency Aberdeen Proving Ground Md
SIMPLIFIED AIRCRAFT PERFORMANCE METHODS: POWER REQUIRED FOR SINGLE AND TANDEM ROTOR HELICOPTERS IN HOVER AND FORWARD FLIGHT.
Technical rept.,
C. Raymond Dietz. Aug 73, 57p Rept no. AMSAA-TR-78

Descriptors: (*Helicopters, Hovering), Helicopter rotors, Rotor blades(Rotary wings), Drag, Thrust, Ground effect, Level flight.
Identifiers: Shaft horsepower, Computer aided analysis.

The report presents a combination graphic and computing method for quick determination of shaft horsepower required for helicopters in hover and forward flight. Sets of equations were developed for computing power required. These equations are based upon theory and test data and show good agreement with published power required data on many currently operating helicopters. The equations have also been programmed for digital computation thereby making possible detailed studies of helicopter performance and the effects of parametric variations. (Author)

AD-768 781/7GA PC$3.00/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
OPERATIONAL EVALUATION OF THE SK-5 AIR CUSHION VEHICLE IN ALASKA.
Technical rept.,
Ronald A. Liston. Sep 73, 47p Rept no. CRREL-TR-243

Descriptors: (*Ground effect machines, Performance(Engineering)), Terrain, Alaska, Trafficability, Maneuverability, Drag, Ground effect.
Identifiers: SK-5 vehicles, Slope climbing.

The report discusses the evaluation of the SK-5 air cushion vehicle, during operations on terrain typical of central Alaska. The intent of the evaluation was to consider the SK-5 as representative of the state of the art rather than as a candidate for a specific military role in Alaska. The study included tests to: determine slope-climbing ability; measure skirt drag; identify maneuverability as a function of surface conditions; determine air flow characteristics through the gap between the skirt and ground; and to identify the change in cushion pressure as a function of obstacle geometry. The test procedures and results are discussed. Conclusions for each test are drawn as is an overall conclusion concerning the potential value of air cushion vehicles in helping to solve Alaskan transportation problems. (Author)

AD-768 842/7GA PC$4.25/MF$1.45
Boeing Vertol Co Philadelphia Pa
HLH GROUND SUPPORT EQUIPMENT (GSE) PRELIMINARY INVESTIGATION.
Final rept. Mar 73-May 73,
John M. Corso, Thomas S. Hammer, and Frank J. Kozloski. Jun 73, 125p Rept no. D301-10188-1
USAAMRDL-TR-73-52
Contract DAAJ02-72-C-0041

Descriptors: (*Helicopters, Ground support equipment), Logistics, Maintenance, Inventory analysis, Small tools, Test equipment, Checkout equipment.
Identifiers: HLH(Heavy Lift Helicopters), Heavy lift helicopters.

The preliminary study was conducted to determine the GSE required for the heavy-lift helicopter (HLH) early enough in the program to allow ample time for development/procurement of long lead time items. The HLH aircraft systems were analyzed during the preliminary design stage to establish maintenance concepts, identify the necessary organizational and direct support level tasks, and select equipment suitable for performing the tasks identified. The selected equipment was classified as existing as-is, existing requiring modification, or not available and requiring new

design and development effort. The elapsed maintenance time and the number of personnel required to perform organizational and direct support level tasks in the Army aviation environment were determined. In some instances, several alternate approaches for GSE were identified which will require trade-offs to complete the equipment selection process. (Modified author abstract)

AD-768 843/5GA PC$4.25/MF$1.45
Systems Associates Inc Long Beach Calif
U. S. ARMY HELICOPTER ROD END BEARING RELIABILITY AND MAINTAINABILITY INVESTIGATION.
Final rept.,
Sheldon Dockswell, and James L. Huffman. Jun 73, 123p Rept no. SAI-R72-012 USAAMRDL-TR-73-35
Contract DAAJ02-71-D-0003

Descriptors: (*Bearings, Failure(Mechanics)), (*Helicopters, Bearings), Airframes, Actuators, Maintenance, Quality control, Ceramic materials, Alignment, Vibration, Costs, Army aircraft.
Identifiers: Rod end bearings, Failure analysis.

The investigation was carried out to identify, isolate, and verify the causes of problems with rod end bearings (REB) used on U.S. Army helicopters and to trace the resulting effects on helicopter availability. Design requirements, quality assurance provisions, maintenance procedures and practices, test requirements, and procurement practices were analyzed to assess their impact upon the current problems. Excessive play between ball and race was found to be the REB's chief failure mode. Design does not adequately contend with a vibratory environment which tends to cause widening of the race. Quality assurance was neither imposed upon the bearing vendors nor demonstrated by airframe manufacturers. A recommendation was made for a specification to be developed to govern existing or new designs, which include a stainless steel ball with a ceramic coating and a graphite race, a slotted spherical bearing, and an elastomeric spherical bearing. The recommended specification for helicopter REB's includes bond and material integrity, loading, vibration, dust, misalignment angle, qualification and conformity requirements. Specific recommendations for improvements to the policies, practices, and procedures are made in the report; hardware improvements are also discussed. (Author)

AD-768 852/6GA PC$3.50/MF$1.45
General Electric Co Pittsfield Mass High Voltage Lab
LIGHTNING EFFECTS ON GENERAL AVIATION AIRCRAFT.
Final rept. Jan-Sep 72,
John A. Plumer. Oct 73, 58p* FAA-NA-73-32-II, FAA-RD-73-99
Contract DOT-FA72NA-656

Descriptors: (*Aircraft, Vulnerability), (*Lightning, Aircraft), Electric discharges, Structural parts, Airframes, Fuel systems, Electrical conductance, Resistance(Electrical), Protection.
Identifiers: General aviation aircraft.

To determine the actual lightning vulnerability of typical light aircraft systems and components, and demonstrate the required vulnerability assessment techniques, analyses and laboratory tests were performed on several typical light aircraft and some of their systems and components. The report describes the engineering and laboratory evaluation of component or system vulnerability. (Author)

AD-768 858/3GA PC$2.75/MF$1.45
Georgia Inst of Tech Atlanta School of Aerospace Engineering
STUDIES IN LOW SPEED FLIGHT.
Final rept. 1 Jun 71-31 Aug 73,
Robin B. Gray, Howard M. McMahon, George T. Bird, and John G. Palfery. Sep 73, 13p AROD-10233:1-E
Grant DA-ARO-D-31-124-71-G177

Descriptors: (*Test facilities, Design), (*Helicopters, Performance(Engineering)), Hovering, Airplane models, Helicopter rotors, Vortices, Rotor blades(Rotary wings), Captive tests.
Identifiers: Low speed flight.

A model helicopter hovering flight test facility is briefly described and the results of the study to date are summarized. The objective is to design, construct, and validate a facility which would closely simulate free still-air conditions in a relatively small confined space. Tests in a one-quarter scale prototype using model airplane propellers successfully demonstrated the basic concept. Results obtained in the larger facility are encouraging and the tests will continue. (Author)

AD-768 869/0GA PC$3.75/MF$1.45
Douglas Aircraft Co Long Beach Calif
DEVELOPMENT OF A GRAPHITE HORIZONTAL STABILIZER.
Interim technical rept. 1 Jan-30 Jun 73,
George M. Lehman, D. M. Purdy, A. Cominski, C. G. Dietz, and R. Teodosiadis. Jul 73, 83p Rept no. MDC-J6080
Contract N00156-70-C-1321

Descriptors: (*Stabilizers(Horizontal tail surface), *Reinforced plastics), Graphite, Epoxy plastics, Laminates, Airplane panels, Design, Structural properties, Loading(Mechanics).
Identifiers: Graphite reinforced composites, Epoxy matrix composites.

The results of analyses and development component tests of the redesigned graphite horizontal stabilizer are presented. The upper and lower skin panels were redesigned with bonded internal stepped-lap titanium doublers at the main pivot and actuator fitting interfaces. The minimum predicted margin-of-safety for the redesigned pivot joint structure is 29% at the first fastener outboard of the titanium doubler. Three development components were fabricated and tested to verify the static and fatigue load capacities of the pivot joint and the static load capacity of the actuator joint. The pivot joint development component attained a static ultimate load of 170% Design Limit Load (DLL) and a residual static ultimate load of 195% DLL after 12,000 hours of simulated fatigue spectrum loading. The actuator joint development component attained a static ultimate load of 195% DLL. The calculated weight of the graphite structure is 183 pounds, an increase of approximately six pounds for the structural redesign, and a reduction of 26% in comparison with the conventional metal structure. Fabrication techniques for the upper and lower skin panels are discussed. Engineering drawings, quality control test results, and the test plan for the second stabilizer unit are included in appendices. (Author)

AD-769 041/5GA PC$4.50/MF$1.45
Hercules Inc Magna Utah Bacchus Works
GRAPHITE COMPOSITE LANDING GEAR COMPONENTS - SIDE BRACE ASSEMBLY AND TORQUE LINK FOR A37B AIRCRAFT.
Final rept. 15 May 71-15 May 73,
R. E. Randolph, J. Witzel, J. N. Burns, H. L. Pritt, and J. C. Tsamisis. 15 May 73, 150p Rept no. H400-12-1-17 AFFDL-TR-73-69
Contract F33615-71-C-1508

Descriptors: (*Landing gear, *Composite materials), Attack bombers, Supports, Carbon fibers, Epoxy plastics, Weight, Design, Manufacturing methods.
Identifiers: A-37 aircraft, A-37B aircraft, Linkages, Braces, Carbon fiber reinforced plastics, Graphite reinforced composites, Oriented fiber composites, Epoxy matrix composites, Chopped fiber composites.

The effort deals with the design, fabrication and testing of three separate components of the main landing gear for A37B aircraft. Specifically, the upperside brace, lower side brace, and torque arm are involved. Designs of point loaded graphite/epoxy composite landing gear components along with their fabrication, including the use of chopped graphite/epoxy curing molds, are presented. The program demonstrated that complex components can be fabricated using chopped and continuous graphite/epoxy to withstand the static and fatigue loads encountered by the production metal components in service. Component weight savings as great as 50 percent have been achieved. (Modified author abstract)

AD-769 042/3GA PC$5.75/MF$1.45
Battelle Memorial Inst Columbus Ohio Columbus Labs
DESIGN GUIDE FOR THE USE OF STRUCTURAL SHAPES IN AIRCRAFT APPLICATIONS. PART I: SELECTION CRITERIA FOR STRUCTURAL SHAPES AND TUBING. PART II: MANUFACTURING METHODS FOR STRUCTURAL SHAPES AND TUBING.
Technical rept.(Final), 1 Aug 71-30 Jul 73,
T. G. Byrer, G. A. Gegel, E. G. Smith, Jr., F. W. Boulger, and D. E. Nichols. Sep 73, 226p* AFML-TR-73-211
Contract F33615-71-C-1929

Descriptors: (*Airframes, Design), (*Manufacturing methods, Airframes), Structural parts, Pipes, Extrusion, Drawing(Machine processing), Rolling(Metallurgy), Aluminum alloys, Titanium alloys, Steel, Beryllium, Refractory metal alloys, Heat-resistant metals + alloys, Nickel alloys, Selection.
Identifiers: *Metal tubing, Superalloys.

A two-part Design Guide was compiled to provide technical information and data in the production of structural shapes and tubing for aircraft and aerospace requirements. Part I provides selection criteria for shapes and tubing based on availabilities, design tolerances, and mechanical and physical properties. Part II discusses manufacturing methods for fabricating structural shapes and tubing, namely, extrusion, drawing, and form rolling. Also Part II reviews competitive processes for manufacturing structural type components. This Design Guide is intended to assist design engineers in assessing the availability and properties of materials being considered in new or modified aircraft and aerospace systems, and to assist potential manufacturers and suppliers in assessing equipment, tooling, and processing requirements for fabricating structural shapes and tubing. Materials for aerospace requirements covered in the document include high-strength aluminum alloys, titanium alloys, steels, superalloys, refractory metals, and beryllium. (Author)

AD-769 061/3GA PC$5.50/MF$1.45
RCA Government and Commercial Systems Burlington Mass Aerospace Systems Div
HELICOPTER INSPECTION DESIGN REQUIREMENTS.
Final rept.,
Douglas O. Blake, Fred W. Hohn, and Frank E. Starses. May 73, 213p* USAAMRDL-TR-73-22
Contract DAAJ02-72-C-0052

Descriptors: (*Helicopters, Maintenance), Design, Airframes, Structural parts, Maintainability, Nondestructive testing, Visual inspection, Maintenance personnel.
Identifiers: Product inspection, Failure analysis, Computer aided analysis.

Existing aircraft and presently used inspection techniques were analyzed to determine the impact of present design on the ease of inspection. Initial engineering analyses established failure modes and inspection techniques for helicopter components which contribute significantly to the inspection problem. Analysis results were supplemented by field interviews with inspectors ex-

perienced in inspection of six aircraft types (AH-1, UH-1, CHm47, CH-54, OH-58, and OH-6). The field survey helped definitize components in each aircraft which present inspection problems. Problem areas were then reviewed and classified into categories. These categories included candidates for component or installation redesign, and changes in inspection technique or interval. Engineering analyses then explored for worthwhile solutions. This report contains the resulting specific recommendations for design approaches which offer improvements in inspection efficiency in future designs and inspection aids which warrant consideration for application to present or future designs. The MAVIS (Model for Analysis of Vehicle Inspection Systems) computer model, described in USAAMRDL Technical Report 72-35, was used to assess quantitatively the improvements in inspection efficiency available through the adoption of the study's recommendations. The modeling indicated significant reduction in maintenance man-hour requirements and improvement in aircraft availability and mission reliability. (Author)

AD-769 062/1GA PC$3.75/MF$1.45
Mechanical Technology Inc Latham N Y
RECOMMENDED DESIGN MODIFICATIONS TO THE CH-47 FORWARD ROTOR-DRIVE GEARBOX.
Technical rept.,
Robert H. Badgley. Jun 73, 86p Rept no. MTI-73TR1 USAAMRDL-TR-73-33
Contract DAAJ02-72-C-0040

Descriptors: (*Transmission gears, Design), (*Helicopter rotors, Drives), Antifriction bearings, Gears, Gear noise, Structural parts, Vibration, Mechanical drawings, Helicopters.
Identifiers: H-47 aircraft, CH-47 aircraft, CH-47C aircraft.

The report describes the results of a study of modifications to existing helicopter power-train hardware for the purpose of reducing acoustic-frequency vibrations and noise. Mechanical vibration analysis methods were put to further tests by applying them to the redesign of CH-47C gearbox components. This program was undertaken carefully and methodically to avoid the excessive costs which often accompany hit-or-miss approaches to gearbox noise reduction. The results include vibration reduction predictions for a number of carefully documented designs. The key products in this overall effort are reduced bearing radial dynamic forces; thus, the results of this program are expected to have major impact upon bearing and gear lifetimes, in addition to the obvious benefits in the area of gearbox noise. (Modified author abstract)

AD-769 063/9GA PC$5.75/MF$1.45
Northrop Corp Hawthorne Calif Electronics Div
IN-FLIGHT STABILIZATION OF EXERNALLY SLUNG HELICOPTER LOADS.
Final rept. 25 Jun 70-17 Jan 72,
David T. Liu. May 73, 237p Rept no. NORT-72-39 USAAMRDL-TR-73-5
Contract DAAJ02-70-C-0067

Descriptors: (*Helicopters, *External stores), (*Loading(Mechanics), Helicopters), Stabilization systems, Cost effectiveness, Cargo, Design, Simulation, Sensors.

The purpose of the study was to select the best technical approaches for stabilizing a wide spectrum of externally slung helicopter loads at forward speeds up to 150 knots equivalent air speed (KEAS). This effort was accomplished in a two-phase program. Phase I was designed to identify and characterize typical sling loads, to establish their aerodynamic and dynamic characteristics, to gain physical understanding of helicopter/sling-load coupling dynamics, and to develop design approaches for stabilizing devices together with criteria and methodology for cost-effectiveness analysis. Phase II was devoted to the performance of a trade-off study of load stabilization systems, the formulation of preliminary design concepts for the most effective load stabilization approaches, and an evaluation of candidate stabilization systems using a moving-base flight simulator. (Modified author abstract)

AD-769 086/0GA PC$5.25/MF$1.45
Boeing Aerospace Co Seattle Wash Research and Engineering Div
EXHAUST SYSTEM INTERACTION PROGRAM.
Final technical rept.,
John E. Postlewaite, and Victor Salemann. Jun 73, 178p Rept no. D162-10467-13 AFAPL-TR-73-59
Contract F33615-70-C-1450

Descriptors: (*Jet bombers, Design), Turbojet engines, Airframes, Exhaust flames, Interactions, Wind tunnel models, Systems engineering.
Identifiers: Computer aided design.

The program consisted of two phases. The purpose of Phase 1 was to define what needs to be known, and when, and with what accuracy to define the engine cycle and thrust required by a proposed airplane, and to develop methods to obtain the required information -- particularly in the engine-exhaust system area. The second phase simulated the preliminary design and engine airframe matching portions of an airplane system development, stressing the evaluation of exhaust system installation losses at several levels of validity. This final report presents a summary of the work. The individual tasks are documented in seven volumes from Phase 1 (Vols. 1 - 7), ten volumes from Phase 1 (Vols. 8 - 17) of Ancilliary Reports (including D162-10467-12). (Author)

N73-30009/7GA PC$8.75/MF$1.45
Boeing Vertol Co., Philadelphia, Pa.
V/STOL TILT ROTOR AIRCRAFT STUDY. VOLUME 5: DEFINITION OF STOWED ROTOR RESEARCH AIRCRAFT.
V. A. Soule. Mar 73, 134p NASA-CR-114598, D222-10060-1-VOL-5
Contract NAS2-6598
Subm-Sponsored in Part by Army.

Descriptors: *Aerodynamic characteristics, *Rotary wings, *Tilting rotors, *Vertical takeoff aircraft, Aircraft design, Aircraft performance, Aircraft stability, Flight tests.

For abstract, see STAR 1121

N73-30010/5GA PC$8.50/MF$1.45
Boeing Vertol Co., Philadelphia, Pa.
V/STOL TILT ROTOR AIRCRAFT STUDY. VOLUME 6: PRELIMINARY DESIGN OF A COMPOSITE WING FOR TILT ROTOR RESEARCH AIRCRAFT.
V. A. Soule, and Y. Badri-nath. Mar 73, 126p NASA-CR-114599, D222-10060-2-VOL-6
Contract NAS2-6598
Subm-Sponsored in Part by Army.

Descriptors: *Composite materials, *Rotary wings, *Tilting rotors, *Vertical takeoff aircraft, Aerodynamic configurations, Aircraft design, Composite structures, Product development.

For abstract, see STAR 1121

N73-30011/3GA PC$20.25/MF$1.45
Boeing Vertol Co., Philadelphia, Pa.
V/STOL TILT ROTOR AIRCRAFT STUDY. VOLUME 7: TILT ROTOR FLIGHT CONTROL PROGRAM FEEDBACK STUDIES.
H. R. Alexander, W. Eason, K. Gillmore, J. Morris, and R. Spittle. Mar 73, 364p NASA-CR-114600, D222-10060-3-VOL-7
Contract NAS2-6598
Subm-Sponsored in Part by Army.

Descriptors: *Aircraft control, *Feedback control, *Rotary wings, *Tilting rotors, *Vertical takeoff aircraft, Aircraft performance, Flight control, Systems analysis.

For abstract, see STAR 1121

N73-30012/1GA PC$6.75/MF$1.45
Boeing Vertol Co., Philadelphia, Pa.
V/STOL TILT ROTOR AIRCRAFT STUDY. VOLUME 9: PILOTED SIMULATOR EVALUATION OF THE BOEING VERTOL MODEL 222 TILT ROTOR AIRCRAFT.
H. Rosenstein, M. A. Mcveigh, and P. A. Mollenkof. Feb 73, 92p NASA-CR-114602, D222-10052-1-VOL-9
Contract NAS2-6598
Subm-Sponsored in Part by Army.

Descriptors: *Flight simulation, *Rotary wings, *Tilting rotors, *Vertical takeoff aircraft, Aerodynamic characteristics, Aircraft performance, Real time operation.

For abstract, see STAR 1121

N73-30016/2GA PC$11.25/MF$1.45
Boeing Commercial Airplane Co., Seattle, Wash.
THE DEVELOPMENT OF AN AUGMENTOR WING JET STOL RESEARCH AIRPLANE (MODIFIED C-8A). VOLUME 1: SUMMARY.
R. H. Ashleman, and H. Kavdahl. Aug 72, 182p NASA-CR-114503, D6-40720-1-VOL-1
Contract NAS2-6025
Seri-2.

Descriptors: *Aerodynamic configurations, *De havilland aircraft, *Lift augmentation, *Short takeoff aircraft, Aircraft performance, Aircraft stability, Flight tests, Systems engineering.

For abstract, see STAR 1121

N73-30017/0GA PC$12.50/MF$1.45
Boeing Commercial Airplane Co., Seattle, Wash.
THE DEVELOPMENT OF AN AUGMENTOR WING JET STOL RESEARCH AIRCRAFT (MODIFIED C-8A). VOLUME 2: ANALYSIS OF CONTRACTOR'S FLIGHT TEST.
H. Skavdahl, and D. H. Patterson. Aug 72, 206p NASA-CR-114504, D6-40720-2-VOL-2
Contract NAS2-6025

Descriptors: *Aerodynamic configurations, *Aircraft performance, *De havilland aircraft, *Lift augmentation, *Short takeoff aircraft, Aerodynamic characteristics, Aircraft reliability, Flight tests.

For abstract, see STAR 1121

N73-30019/6GA PC$5.50/MF$1.45
Techtran Corp., Silver Spring, Md.
METHODS AND TECHNIQUES OF AIRFRAME STRENGTH FLIGHT TESTS.
A. I. Gudkov, and P. S. Leshakov. Aug 73, 224p NASA-TT-F-769
Contract NASW-2485
Tran-Transl. Into English of the Book "Metody I Tekhnika Letnykh Ispytaniy Samoletov NA Prochnost' Moscow, Mashinostr., 1972 p 1-248.

Descriptors: *Airframes, *Flight tests, *Structural analysis, *Structural stability, *Vibration tests, Aircraft performance, Data acquisition, Reliability analysis, Systems engineering.

For abstract, see STAR 1121

N73-30020/4GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EFFECT OF WING ASPECT RATIO AND FLAP SPAN ON AERODYNAMIC CHARAC-

TERISTICS OF AN EXTERNALLY BLOWN JET-FLAP STOL MODEL.
C. C. Smith, Jr.. Aug 73, 137p NASA-TN-D-7205, L-8752

Descriptors: *Aerodynamic configurations, *Externally blown flaps, *Short takeoff aircraft, *Static aerodynamic characteristics, *Wind tunnel models, Aerodynamic coefficients, Flow characteristics, Pressure distribution.

For abstract, see STAR 1121

N73-30021/2GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
WIND TUNNEL INVESTIGATION OF EFFECTS OF VARIATIONS IN REYNOLDS NUMBER AND LEADING-EDGE TREATMENT ON THE AERODYNAMIC CHARACTERISTICS OF AN EXTERNALLY BLOWN JET-FLAP CONFIGURATION.
L. P. Parlett, C. C. Smith, Jr., and J. L. Megrail. Aug 73, 155p NASA-TN-D-7194, L-8745
Subm-Prepared in Cooperation with Army Air Mobility R and D Lab., Hampton, VA.

Descriptors: *Aerodynamic configurations, *Externally blown flaps, *Short takeoff aircraft, *Transport aircraft, *Wind tunnel tests, Aerodynamic characteristics, Aircraft performance, Reynolds number.

For abstract, see STAR 1121

N73-30026/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AIRPORT-AREA AIRSPACE USED IN SIMULATED OPERATIONS WITH AN EXPERIMENTAL POWERED-LIFT STOL AIRPLANE.
N. S. Silsby, and R. H. Sawyer. Sep 73, 29p NASA-TN-D-7300, L-8869

Descriptors: *Airspace, *Flight safety, *Short takeoff aircraft, *Terminal facilities, *Transport aircraft, Aircraft performance, Airports, Flight paths.

For abstract, see STAR 1121

N73-30032/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
LANDING PERFORMANCE OF AN AIR CUSHION LANDING SYSTEM INSTALLED ON A 1/10-SCALE DYNAMIC MODEL ON THE C-8 BUFFALO AIRPLANE.
W. C. Thompson. Sep 73, 27p NASA-TN-D-7295, L-8724

Descriptors: *Aircraft landing, *Ground effect machines, *Inflatable structures, *Transport aircraft, Aircraft performance, Performance tests, Scale models, Surface properties.

For abstract, see STAR 1121

N73-30033/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
FULL-SCALE WIND-TUNNEL INVESTIGATION OF EFFECTS OF SLOT SPOILERS ON THE AERODYNAMIC CHARACTERISTICS OF A LIGHT TWIN-ENGINE AIRPLANE.
H. A. Verstynen, Jr., and D. Andrisani, Ii. Sep 73, 34p NASA-TN-D-7315, L-8865

Descriptors: *Aircraft configurations, *Flaps (Control surfaces), *Light aircraft, *Spoilers, *Wind tunnel tests, Aerodynamic characteristics, Aircraft performance, Aircraft stability.

For abstract, see STAR 1121

N73-30037/8GA PC$3.00/MF$1.45
Royal Netherlands Aircraft Factories Fokker, Amsterdam. Manufacturing Research and Product Development Dept.
ADHESIVE BONDING IN THE FOKKER-VFW F-28 'FELLOWSHIP'.
R. J. Schliekelmann. Feb 73, 15p FOK-K-67

Descriptors: *Adhesive bonding, *Composite structures, *F-28 transport aircraft, *Quality control, Aircraft design, Aircraft structures, Fatigue life, Full scale tests, Inspection.

For abstract, see STAR 1121

N73-30931/2GA PC$5.25/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany). Inst. fuer Angewandte Gasdynamik.
AERODYNAMIC COMPARISON OF TWO REAR FUSELAGE SHAPES (PENCIL-POINT AND KNIFE-EDGE) AERODYNAMISCHER VERGLEICH ZWEIER RUMPFHECKFORMEN (SPINDELHECK UND TUBENHECK).
G. Schulz, and K. Wichmann. 30 Mar 72, 65p DLR-FB-72-25
In German; English Summary.

Descriptors: *Aerodynamic configurations, *Aircraft design, *Fuselages, Aerodynamic drag, Aircraft models, Aircraft stability, Bodies of revolution, Noses (Forebodies), Pressure distribution, Stability derivatives, Streamlined bodies.

For abstract, see STAR 1122

N73-30941/1GA PC$3.00/MF$1.45
Columbia Univ., New York. Noise Research Unit.
ANNOYANCE JUDGEMENTS OF AIRCRAFT WITH AND WITHOUT ACOUSTICALLY TREATED NACELLES.
P. N. Borsky, and S. Leonard. Aug 73, 73p NASA-CR-2261
Contract NGL-33-008-118

Descriptors: *Acoustic measurements, *Jet aircraft noise, *Noise reduction, Acoustic properties, Human reactions, Noise intensity.

For abstract, see STAR 1122

N73-30942/9GA PC$3.75/MF$1.45
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris (France).
DIRECTIONAL EQUIPMENT FOR REDUCING JET NOISE AT HIGH SPEED DISPOSITIES DIRECTIONNELS DE REDUCTION DU BRUIT DES JETS A GRANDE VITESSE.
R. Hoch, M. Julliand, and H. Lacombe. 1972, 32p Conf-Presented at 1ST Intern. Symp. On the Progr. Of Aviation Reactors, Marseille, 19-23 Jun. 1972.
Language in French.

Descriptors: *Concorde aircraft, *Control equipment, *Noise reduction, *Propellers, Aerodynamic coefficients, Flight, High speed, Low speed.

For abstract, see STAR 1122

N73-30943/7GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
COMPUTERIZED PRELIMINARY DESIGN AT THE EARLY STAGES OF VEHICLE DEFINITION.
T. J. Gregory. Sep 73, 35p NASA-TM-X-62303

Descriptors: *Aerodynamic configurations, *Aircraft design, *Computerized design, *Remotely piloted vehicles, *Structural design criteria, Cost analysis, Structural design, Technology utilization.

For abstract, see STAR 1122

N73-30948/6GA PC$9.00/MF$1.45
United Aircraft Corp., Stratford, Conn. Sikorsky Aircraft.
APPLICATION OF COMPOSITES TO HELICOPTER AIRFRAME AND LANDING GEAR STRUCTURES.
Technical Report, Jul. 1972 - Feb. 1973.
M. J. Rich, G. F. Ridgley, and D. W. Lowry. Jun 73, 138p NASA-CR-112333
Contract NAS1-11688
Subm-Sponsored in Part by Army Air Mobility R and D Lab., Hampton, VA.

Descriptors: *Airframes, *Composite materials, *Composite structures, *Helicopters, *Landing gear, Production engineering, Quality control, Service life.

For abstract, see STAR 1122

N73-30952/8GA PC$6.00/MF$1.45
Rao (G. V. R.) and Associates, Sherman Oaks, Calif. Aerodynamics and Propulsion Technology.
ANALYTICAL LIFT FAN NOISE STUDY.
Interim Report, 13 Apr. 1971 - 13 June 1972.
G. V. R. Rao, W. T. Chu, and R. V. Digumarthi. 13 Jul 73, 78p NASA-CR-114576
Contract NAS2-6401

Descriptors: *Acoustic properties, *Aerodynamic noise, *Air flow, *Axial flow, *Propeller fans, Acoustic measurements, Sound fields, Sound propagation.

For abstract, see STAR 1122

N73-31510/3GA PC$11.75/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands).
SOME CONSIDERATIONS FOR THE APPLICATION OF TITANIUM ALLOYS IN COMMERCIAL AIRCRAFT.
R. J. H. Wanhill. Mar 72, 191p NLR-TR-72034-U
Subm-Sponsored by the Neth. Agency for Aerospace Programs.

Descriptors: *Aircraft parts, *Commercial aircraft, *Fail-safe systems, *Titanium alloys, Aircraft design, Aircraft engines, Aircraft structures, Airframes, Crack propagation, Fatigue (Materials), Fracture strength, Stress corrosion.

For abstract, see STAR 1122

PAT-APPL-237491/GA PC$3.25/MF$1.45
Aeronautical Research Associates of Princeton, Inc., N.J.
INTEGRATED LIFT/DRAG CONTROLLER FOR AIRCRAFT.
Patent Application.
J. W. Olcott, E. Seckel, and D. R. Ellis. Filed 23 Mar 72, 25p NASA-CASE-ARC-10456-1, Contract NAS2-5589
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Aircraft control, *Aircraft landing, *Engine control, *Flight control, *Glide paths, Aircraft equipment, Equipment specifications, Patent applications.

An integrated lift/drag controller for aircraft is described. The system integrates the control of engine power and devices which are capable of altering the lift/drag ratio of a powered aircraft. Specific application is to control the glide path angle and air speed of the aircraft during approach, flare, touchdown, rollout, and emergency descents. Diagrams of the system and details of the operation are presented.

PAT-APPL-253725/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
THREE-AXIS, ADJUSTABLE LOADING STRUCTURE.
Patent Application.

E. J. Lynch, and D. T. Gray. Filed 16 May 72, 12p NASA-CASE-FRC-10051-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Aircraft specifications, *Loads (Forces), *Measuring instruments, Aircraft configurations, Aircraft structures, Electric motors, Jacks (Lifts), Patent applications.

A three-axis, adjustable loading structure is described for resting the soundness of a structure, such as the skin of an aircraft, by applying pressure. The device has three electric drives which permit rapid and accurate measurement of wall angle, horizontal position, and vertical position of the test device.

PAT-APPL-321180/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SINGLE WING SUPERSONIC AIRCRAFT.
Patent Application.
R. T. Jones. Filed 5 Jan 73, 39p NASA-CASE-ARC-10470-2,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Aerodynamic configurations, *Aircraft design, *Supersonic aircraft, *Wing planforms, Aerodynamic characteristics, Aircraft performance, Patent applications.

An aircraft is described with a single fuselage having a main wing and a horizontal stabilizer airfoil pivotally attached at their centers to the fuselage. The pivotal attachments allow the airfoils to be yawed relative to the fuselage for high speed flight, and to be positioned at right angles with respect to the fuselage during take-off, landing, and low speed flight. The main wing and the horizontal stabilizer are upwardly curved from their center pivotal connections towards their ends to form curvilinear dihedrals.

PATENT-3 517 550/GA Not available NTIS
Department of the Navy Washington D C
LOAD AND RATE OF CHANGE OF LOAD DETECTION SYSTEM.
Patent,
Robert S. Lenenthal. Filed 8 May 68, patented 30 Jun 70, 5p Rept nos. PAT-APPL-727 526,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Landing gear, *Patents), (*Aircraft landings, Landing impact), Shock absorbers, Instrumentation, Pressure gages, Logic circuits.
Identifiers: PAT-CL-73-88-5.

The present invention relates to a system for detecting and recording the level and rate of change of landing loads in the struts of aircraft landing gear. The system uses pressure sensors in the struts. The sensors are connected to a plurality of measuring circuits which are operable in response to a minimum pressure to record the level and rate of change of pressure detected by the sensor.

SLA-73-5294/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
ANALYSIS OF DEPLOYMENT AND INFLATION OF LARGE RIBBON PARACHUTES.
D. F. McVey, and D. F. Wolf. 1973, 13p CONF-730523-2

Descriptors: (*Parachutes, *Performance testing), Aircraft, Drag, Mathematical models, Size, Testing, Wind.

For abstract, see NSA 28 08, number 20649.

SLA-73-739/GA PC$3.50/MF$1.45
COMPRESSED-AIR ACCELERATOR INSTALLATION FOR MODEL PARACHUTES.
G. Braun. 1973, 29p
Translation of IB--154-73/2.

Descriptors: (*Parachutes, *Performance testing), Air, Compression, Compressors, Drag, Structural models, Velocity.

For abstract, see NSA 28 08, number 20647.

1D. Aircraft Flight Control and Instrumentation

AD-768 382/4GA PC$7.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
APPLICATION OF THE AEROSPACE MULTIPROCESSOR TO THE A-7D FLIGHT CONTROL SYSTEM.
Master's thesis,
Robert Russell Summers. Jun 73, 102p Rept no. GGC/EE/73-17

Descriptors: (*Flight control systems, Digital computers), (*Attack bombers, Flight control systems), Programming(Computers), Multiple operation, Theses.
Identifiers: A-7 aircraft, A-7D aircraft, *Multiprocessors, *Fly by wire flight control systems, *Man in the loop control systems, TRANSLANG computer program, Avionics.

The application of the Aerospace Multiprocessor as the flight control computer for a digital fly-by-wire control system for the A-7D aircraft is described. First a brief discussion of the evolution of flight control systems, ranging from mechanical to digital fly-by-wire, is presented. Next, the topic of digital computers for aircraft flight control is covered. First general computer characteristics are discussed. This is followed by an extensive discussion of Aerospace Multiprocessor characteristics and principles of operation. The present analog flight control system for the A-7D aircraft is described. Various methods of digitizing the A-7D flight control system are considered. The Tustin method of digitization is covered at length, and difference equation derivations are shown in detail. The flight control microprogram written for the Aerospace Multiprocessor is described at a flowchart level. A multiply subroutine, written during this study, is described in detail. Then a description is given of the laboratory tests that were made with the Aerospace Multiprocessor programmed for flight control. Test results are discussed. Finally, the Aerospace Multiprocessor is evaluated regarding its suitability for use in a flight control application. (Author)

AD-768 392/3GA PC$3.75/MF$1.45
Instrument Flight Center Randolph AFB Tex
OPERATIONAL TEST AND EVALUATION OF R. C. ALLEN THREE-INCH ATTITUDE INDICATOR.
Final rept.,
Joseph K. Beaty. Sep 73, 76p Rept no. IFC-TR-73-11

Descriptors: (*Attitude indicators, Flight testing), Installation, Human engineering, Pilots, Questionnaires, Optimization.

The Research and Development Division of the USAF Instrument Flight Center conducted a test and evaluation of the R. C. Allen 3-inch self-contained attitude indicator, model 26C-1. Approximately 50 hours were flown, using a T-37 as the test bed to evaluate the indicator. Primary emphasis of the evaluation was from a human factors aspect rather than an engineering performance. (Modified author abstract)

AD-768 722/1GA PC$3.00/MF$1.45
Instrument Flight Center Randolph AFB Tex
EVALUATION OF THE MODIFIED BENDIX AAU 19A/A AIMS ALTIMETER.
Final rept.,
Manuel H. Tapia. Aug 73, 19p Rept no. IFC-TR-73-8

Descriptors: (*Altimeters, Flight testing), (*Aircraft intercept cor ol systems, Identification systems), Flight instruments, Special purpose computers, Display systems, Reliability(Electronics), Human engineering.
Identifiers: AIMS program, AAU-19A/A altimeters, Aircraft identification systems, CPU-46A altitude computers, Intraservice activities.

The USAF Instrument Flight Center, Research and Development Division (IFC/RD), evaluated the modified Bendix AAU 19A/A AIMS altimeter from a pilot factors point of view. The emphasis was placed on hang and lope deficiencies noted during the original IFC evaluation of the Bendix AAU 19A/A altimeter (IFC TR-73-2). Three different types of aircraft were used for the evaluation -- a T-38 was used to investigate high performance capabilities of the altimeter while another altimeter was installed in a T-39 and a third in a T-29 to evaluate the altimeters' performance in a slower airspeed regime. Experienced instructor pilots from IFC/RD and several Instrument Pilot Instructor School (IPIS) student pilots evaluated the altimeter during 45 missions totaling approximately 60 hours of flying time. (Modified author abstract)

N73-30034/5GA PC$5.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Abteilung Instrumentierung und Anthropotechnik.
TACHISTOSCOPIC INVESTIGATIONS ON ELECTRONIC AND CONVENTIONAL COCKPIT DISPLAYS TACHISTOSKOPISCHE UNTERSUCHUNGEN AN ELEKTRONISCHEN UND KONVENTIONELLEN ANZEIGEN FUER DIE FLUGFUEHRUNG.
W. Heinze. 1973, 56p DLR-FB-73-27
Subm-Sponsored by Deut. Forschungsgemeinschaft Prepared Jointly with Tech. Univ. Brunswick.
In German; English Summary.

Descriptors: *Cockpits, *Display devices, *Performance tests, *Tachistoscopes, Aircraft guidance, Electromechanical devices, Electronic equipment, Flight control, Flight instruments, Instrument landing systems.

For abstract, see STAR 1121

N73-30953/6GA PC$4.25/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany). Abteilung Flugbahnen.
DESIGN OF A LATERAL FLIGHT DIRECTOR.
W. Schattenmann. 13 Jul 72, 42p DLR-FB-72-44
In German; English Summary.

Descriptors: *Aircraft control, *Aircraft design, *Flight control, *Instrument landing systems, *Lateral control, Aircraft pilots, Human factors engineering, Landing instruments, Man machine systems, Manual control.

For abstract, see STAR 1122

PATENT-3 750 168/GA Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
APPARATUS FOR AIDING A PILOT IN AVOIDING A MIDAIR COLLISION BETWEEN AIRCRAFT.
Patent.
J. H. Schrader, and R. H. Couch. Patented 31 Jul 73, 13p NASA-CASE-LAR-10717-1,
Misc-Filed 7 Apr. 1972 Supersedes N72-27703 (10 - 18, p 2463).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Collision avoidance, *Flight safety, *Midair collisions, *Warning systems, Electronic equipment, Equipment specifications, Patents.

An apparatus for aiding a pilot in avoiding a midair collision between aircraft is described. A protected aircraft carries a transmitter, a transponder, a receiver, and a data processor; and an intruding cooperating aircraft carries a transponder. The transmitter of the protected aircraft continuously transmits a signal to the transponders of all intruding aircraft. The transponder of each of the intruding aircraft adds the altitude of the intruding aircraft to the signal and transmits it back to the receiver of the protected aircraft. The receiver selects only the signal from the most hazardous intruding aircraft and applies it to the data processor. From this selected signal the data processor determines the closing velocity between the protected and intruding aircraft, the range between the two aircraft, their altitude difference and the time to a possible collision.

1E. Air Facilities

PB-224 405/1GA PC$5.25/MF$1.45
Environmental Protection Agency, Washington, D.C. Office of Noise Abatement and Control.
REVIEW AND ANALYSIS OF PRESENT AND PLANNED FAA NOISE REGULATORY ACTIONS AND THEIR CONSEQUENCES REGARDING AIRCRAFT AND AIRPORT OPERATIONS.
Final rept.
27 Jul 73, 183p* EPA-NTID73.6

Descriptors: (*Regulations, Impact), (*Airports, *Noise reduction), (*Aircraft noise, Regulations), Environmental surveys, Land use, Public law, Recommendations, Environmental engineering, Stress(Physiology).
Identifiers: *Noise pollution, Noise abatement, Noise control, Federal Aviation Administration, Noise exposure.

The report is a result of an extensive task force effort to gather all available data pertinent to review and analysis of present and planned FAA noise regulatory actions and their consequences regarding aircraft and airport operations. It represents the interpretation of such data by the task group chairman responsible for this specific report. It does not necessarily reflect the official views of EPA and does not constitute a standard, specification or regulation.

2. AGRICULTURE

2D. Agronomy and Horticulture

BNL-17970/GA PC$3.25/MF$1.45
Brookhaven National Lab., Upton, N. Y.
INTERSPECIFIC PLANT HYBRIDIZATION AND THE GENETICS OF MORPHOGENESIS.
H. H. Smith. 1973, 21p CONF-730643-1

Descriptors: (*Nicotiana, Hybridization), (*Hybridization, *Genetics), Flowers, Genes, Mutants, Neoplasms.

For abstract, see NSA 28 07, number 17715.

BNL-18004/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
REGULATION OF CELL DIVISION IN HIGHER PLANTS.
J. Van't Hof. 1973, 17p CONF-730643-3

Descriptors: (*Seeds, Mitosis), (*Meristems, Mitosis), (*Mitosis, *Inhibition), Cell cycle, Cell proliferation, Pisum, Plants, Roots.

For abstract, see NSA 28 07, number 17716.

JPRS-60221/GA PC$4.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
SELECTION AND SEED GROWING. NUMBER 3, 1973.
9 Oct 73, 164p
Trans. of Selektsiya i Semenovodstvo (USSR) n3 80p 1973.

Descriptors: (*Seeds, Plant growth), (*Grain crops, USSR), Plant genetics, Selection, Wheat plants, Barley plants, Plant diseases, Rusts(Fungi), Rye plants, Decontamination, Proteins, Quality, Irradiation, Viability, Seasonal variations, Pollen, Agricultural machinery, Translations.

The report contains articles on the selection, control and growing of grain seed in the USSR.

N73-31357/9GA PC$6.75/MF$1.45
Minnesota Univ., St. Paul. Inst. of Agriculture Remote Sensing Lab.
REMOTE SENSING APPLICATIONS IN AGRICULTURE AND FORESTRY. APPLICATIONS OF AERIAL PHOTOGRAPHY AND ERTS DATA TO AGRICULTURAL, FOREST AND WATER RESOURCES MANAGEMENT.
Annual Progress Report.
1 Jul 73, 91p NASA-CR-135483, IARSL-73-1
Contract NGL-24-005-263

Descriptors: *Aerial photography, *Agriculture, *Earth resources technology satellites, *Forests, *Minnesota, *Water resources, Crop identification, Diseases, Resources management, Vegetation.

For abstract, see STAR 1122

N73-31359/5GA PC$4.75/MF$1.45
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
ESTIMATING CROP ACREAGE FROM SPACE-SIMULATED MULTISPECTRAL SCANNER DATA.
R. F. Nalepka, and P. D. Hyde. Aug 73, 53p
NASA-CR-134029, ERIM-31650-148-T
Contract NAS9-9784

Descriptors: *Multispectral band scanners, *Remote sensors, Algorithms, Crop identification, Estimating.

For abstract, see STAR 1122

N73-31555/8GA PC$3.25/MF$1.45
Rice Univ., Houston, Tex. Inst. for Computer Services and Application.
A MATHEMATICAL MODEL CONCERNING REFLECTANCE FROM A ROW CROP.
R. K. Jaggi. Sep 72, 22p NASA-CR-133989, ICSA-275-025-001
Contract NAS9-12776

Descriptors: *Crop identification, *Mathematical models, *Spectral reflectance, Foliage, Leaves, Soils.

For abstract, see STAR 1122

PB-224 469/7GA PC$5.00/MF$1.45
Maryland State Highway Administration, Brooklandville. Bureau of Research.
EVALUATION OF WOODY PLANTS AND DEVELOPMENT OF ESTABLISHMENT PROCEDURES FOR DIRECT SEEDING AND/OR VEGETATIVE REPRODUCTION.
Rept. for Apr 66-Jun 72,
H. W. Everett, G. V. Schultz, and R. F. Dudley.
May 73, 58p

Descriptors: (*Plants(Botany), Highways), (*Highways, Plant reproduction), Shrubs, Trees(Plants), Seeds, Plant growth, Survival, Recommendations, Adaptation, Mixtures, Fertilizers, Mulches, Evaluation, Leguminous plants, Slopes, Maintenance, Soil erosion, Reviews.
Identifiers: Hydroseeding, Plant selection.

A literature review was made to prepare a list of potential species based on adaptability, stratification requirements, aesthetic value and seed availability. Species were rated for adaptability, ease of establishment and growth rates in initial plantings. From at least 56 potential species, 25 species are still under investigation and 10 species are currently recommended for plantings. Hydroseeding woody plant species has been successful when a grass-legume cover-companion mixture that controls erosion and allows bare soil to be exposed in some areas is used. The woody seedlings become established in the bare soil areas. Successful plantings have been made with a seeder that buries the seed under the soil in rows. This seeder can be used on relatively flat areas for planting snow, wind, and noise control screens, and shrub beds. Planting dates, survival and growth rates of bare root seedlings vs. seedling stock grown in peat pellets was compared. Recommendation includes: seeding dates, cover-companion mixtures, successful woody species, lime and fertilizer application, seed incorporation, mulch and mulch anchoring and legume inoculation. Stratification requirements, seeding depth recommendations and seed per per pound statistics are presented.

TT-72-51127/GA PC$3.00/MF$1.45
Agricultural Research Service, Washington, D.C.
CALCULATION OF DYNAMICS OF GROWTH OF SUGAR BEET VARIETIES (UCHET DINAMIKI ROSTA ISPTYVAEMYKH MORTOV SAKHORNOI SVEKLY),
P. A. Mishchenko. 1973, 13p
Trans. of Sakharnaya Svekla (USSR) n3 p29-31 1971. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Sugar beets, Plant growth), Plant tissues, Weight(Mass), Sampling, Plant genetics, Selection, Translations, USSR.

The dynamics of growth of root, leaves and sugar is not the same in different varieties and hybrids of sugar beet. Therefore, in strain testing great significance is attached to the calculation of these indices for determining the earliness of ripening of each variety (hybrid). Investigations are made to increase the accuracy of these calculations.

TT-72-51128/GA PC$3.00/MF$1.45
Agricultural Research Service, Washington, D.C.
CARROT CULTIVATION IN A CONVEYOR USING THE AEROPONIC METHOD (O VYRASHCHIVANII MORKOVI V KONVELEIRE NA AEROPONIKE),
E. V. Lebedeva, L. V. Dimitrieva, and M. V. Vilyams. 1973, 13p
Trans. of Agrokhimiya (USSR) n5 p97-101 1970. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Root crops, Cultivation), Carrots, Photoperiodism, Carbohydrates, Carotenes, Translations, USSR.

The purpose of the study is to describe the aeroponic conveyor method for use in carrot cultivation using artificial light. Three periods of plant growth rates, and changes in composition and biomass are determined.

TT-72-51131/GA PC$3.25/MF$1.45
Agricultural Research Service, Washington, D.C.
TECHNOLOGICAL MODIFICATION OF THE SEEDLING METHOD AND ANALYSIS OF ITS USEFULNESS FOR EVALUATION OF SALT TOLERANCE IN PLANTS (TEKHNOLOGICHESKAYA MODIFIKATSIYA METODA PROROSTKOV I ANALYZ EGO PRIGODNOSTI DLYA OTSENKI SOLEUST OICHIVOSTI RASTENII),
Yu. M. Ivanov, and G. V. Udovenko. 1973, 24p
Trans. of Trudy po Prikladnoi Botanike, Genetike i Selektsii (USSR) v43 n1 p160-167 1970. Spon-

sored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Plants(Botany), *Saline soils), Inorganic salts, Germination, Plant growth, Evaluation, USSR, Translations.

The report discusses suitable methods for the germination of seeds where salt tolerance is a factor, and evaluates these methods.

2E. Animal Husbandry

COM-73-11812/7GA PC$3.75/MF$1.45
Ohio Agricultural Research and Development Center, Wooster.
PHYSIOLOGICAL EFFECTS OF FISH MEAL ON SWINE.
Completion rept. Jan 72-Mar 73,
A. P. Grifo. Jun 73, 31p NOAA-73090609
Grant NMFS-3-159-R

Descriptors: (*Swine, Animal nutrition), (*Animal nutrition, Fish protein concentrates), Herrings, Fishes, Diets, Reproduction(Biology), Growth, Tables(Data).

The report is on research conducted to determine the nutritional value of whole fish meal (Menhaden) in breeding gestation and lactation diets of swine. Experiments using 6 or 12% whole fish meal in the diets of gilts and sows for two generations did not increase litter size at birth, but did increase the weight of pigs at birth. Pigs whose dams were fed the 6% diet were significantly heavier at 42 days of age. Fish meal added to the diet at 6 or 12% increases selenium content of the lactating sow's blood and milk, and the selenium blood level of their offspring. These results demonstrate that whole fish meal is a good source of supplemental protein for the sow and that under some conditions a beneficial effect on performance will result from its inclusion in the diet.

JPRS-60161/GA PC$2.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
SOME MODELS OF EPIZOOTOLOGICAL FORECASTS,
M. G. Tarshis, V. E. Gudim, R. F. Iopa, G. I. Romanova, and N. V. Slepynina. 28 Sep 73, 8p
Trans. of Veterinariya (USSR) n7 p42-44 1973.

Descriptors: (*Animal diseases, Forecasting), (*Prophylaxis, Animal diseases), Geography, Immunology, Infectious diseases, Computers, Mathematical models, Veterinary medicine, Translations, USSR, Economic factors, Epidemiology.
Identifiers: *Epizootiology.

The report contains a discussion of the research done in the field of epizootological forecasting. The combined use of different methods is of value in making more accurate epizootological forecasts. The variety of methods and the particular ones to be chosen depend on the specific nature of the disease in question and the tasks confronting the investigator. Forecasting based on the use of a great variety of methods, especially precision ones, is a major tool. It is a very important branch of operations research in epizootology, a means of finding the best solutions to problems of disease prevention.

PB-224 400/2GA MF$1.45
National Rsearch Council, Washington, D.C. Committee on Animal Health.
CONTROL OF RABIES.
May 73, 33p
International Standard Book No. 0-309-02124-3
Prepared by National Academy of Sciences, Washington, D.C.
Paper copy available from National Academy of Sciences, Printing and Publishing Office. 2101 Constiution Ave., Wash. D.C. $2.00.

Descriptors: (*Rabies, Prophylaxis), (*Vaccines, Rabies), (*Wildlife, Rabies), Infectious diseases, Nervous system disorders, Viral diseases, Convulsive disorders, Pathology, Immunity, Public health, Veterinary medicine, Mammals, Animal diseases, Epidemiology, Arboviruses, Rabies virus.
Identifiers: Rhabdovirus, Neurotropic viruses.

The report deals with the pathogenesis of rabies; virus-wildlife interactions; vaccines and regulatory aspects; and control programs for the four classes of hosts involved in rabies--domestic pets, wild animals, domestic livestock, and man. This valuable guide provides practical, current, and concise information on all aspects of rabies control. A compendium of animal rabies vaccines is presented at the conclusion of the report that includes information on live and inactive vaccines licensed in the United States. Specific information provided includes the name of each vaccine, companies licensed to sell these vaccines, suggested regimen recommended, and duration of immunity.

PB-224 427/5GA MF$1.45
National Academy of Sciences, Washington, D.C.
ALTERNATIVE SOURCES OF PROTEIN FOR ANIMAL PRODUCTION.
31 Jul 72, 184p*
Internal Standard Book No. 0-309-02114-6
Proceedings of a Symposium. Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
Paper copy available from National Academy of Science Printing and Publishing, 2101 Constitution Ave., Washington, D.C. $5.75.

Descriptors: (*Feeding stuffs, Proteins), (*Livestock, Feeding stuffs), Meetings, Grains(Food), Forage corps, Food processing, Meat, Blood, Oilseeds, Fish protein concentrates, Agricultural wastes, Industrial wastes, Quality, Utilization, Evaluation, Animal nutrition.
Identifiers: Animal wastes.

For the benefit of livestock and poultry producers, feed manufacturers and scientists and researchers in animal husbandry, this report reviews potential sources of protein and considers ways to increase the quantity and improve the biological value of protein for animal production. Some of the symposium papers presented in the report explore measures for enhancing protein supplies from known proteinaceous feeds, while others identify and evaluate some new or underutilized sources. In discussions of known sources of protein, the report considers ways to improve the quantity and quality of protein in cereal grain, separate protein from fiber in forage crops, improve the processing and utilization of animal by-product proteins, increase production of oilseed protein, change utilization patterns. New sources of protein discussed include such less-utilized oilseeds as sunflower and sesame, the grain legumes, whole fish protein, single- cell protein from industrial wastes, and recycled animal wastes.

PB-224 617/1GA MF$1.45
National Research Council, Washington, D.C. Committee on Veterinary Medical Research and Education.
NEW HORIZONS FOR VETERINARY MEDICINE.
Feb 72, 177p
Library of Congress Catalog Card no. 74-181827
International Standard Book no. 0-309-01935-4.
Sponsored in part by American Veterinary Medical Association, United States Army, Food and Drug Administration. United States Department of Agriculture, Smith Kline and French Foundation, Seeing Eye, Inc.
Paper copy available from National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Ave., Washington, D.C. 20418 $5.25.

Descriptors: (*Veterinary medicine, Handbooks), Reviews, Education, History, Universities, Statistical data, Organizations.

Emphasizing the broad utilitarian value of veterinary medicine to many segments of society, this book presents an overview of veterinary medical research and education as it is today, evaluates its strengths and weaknesses, and makes specific recommendations for its support in the future. It also presents a brief review of the historical context within which veterinary medicine has developed and describes the various kinds of veterinary practice.

2F. Forestry

E73-10988/GA PC$4.00/MF$1.45
Democritus Nuclear Research Center, Athens (Greece).
APPLICATION OF ERTS-1 IMAGERY TO LAND USE, FOREST DENSITY AND SOIL INVESTIGATIONS.
Progress rept. Dec 72-Jul 73,
Nicholas J. Yassoglou. 25 Aug 73, 37p NASA-CR-133767

Descriptors: Greece, Land use, Forests, Soil science, Earth resources program, Agriculture, Mapping, Spectral signatures.

The author has identified the following significant results. Photographic and digital imagery obtained by ERTS-1 was analyzed and assigned to land features related to agricultural and forest resources. Land use and forest site evaluation maps were prepared by comparing remote sensing and ground truth data. Relationships found in this investigation between spectral signatures recorded by ERTS-1 and land features can be used for the assessment and development of agricultural and forest resources. The results are applicable to areas with ecological and geological conditions similar to those of Greece.

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

AD-768 510/0GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
SACRAMENTO PEAK OBSERVATORY,
John W. Evans. 1970, 3p Rept no. AFCRL-TR-73-0488
Availability: Pub. in the Bulletin American Astronomical Society, v2 n1 p120-121 1970.

Descriptors: (*Astronomical observatories, Reports), New Mexico, Solar atmosphere, Astronomical data.
Identifiers: Sunspot(New Mexico).

The document is the annual report of the research program, new instruments and personnel of Sacramento Peak Observatory.

N73-30222/6GA PC$3.50/MF$1.45
Smithsonian Astrophysical Observatory, Cambridge, Mass.
SMITHSONIAN ASTROPHYSICAL OBSERVATORY REFERENCE SYSTEM BULLETIN, NO. 1.
Feb 73, 28p NASA-CR-133829, REPT-301-056
Contract NGR-09-015-002

Descriptors: *Coordinates, *Earth rotation, Data processing, Data reduction, Satellite tracking, Statistical analysis, Time measurement.

For abstract, see STAR 1121

N73-30783/7GA PC$6.35/MF$1.45
Techtran Corp., Glen Burnie, Md.
METHODS OF INVESTIGATING VARIABLE STARS.
V. B. Nikonov. Jul 73, 255p NASA-TT-F-797

Contract NASW-2037
Tran-Transl. Into English of the Publ. "Metody Issledovaniya Peremennykh Zvezd" Moscow, Nauka, 1971 334 p.

Descriptors: *Astronomical photography, *Measuring instruments, *Photointerpretation, *Stellar luminosity, *Variable stars, Astronomical photometry, Electrophotometers, Image intensifiers, Photographic measurement, Television equipment.

For abstract, see STAR 1121

N73-30809/0GA PC$4.25/MF$1.45
Stanford Univ., Calif. Radioscience Lab.
RESEARCH AT THE STANFORD CENTER FOR RADAR ASTRONOMY.
Semiannual Status Report, 1 Jul. - 31 Dec. 1972.
Feb 73, 51p NASA-CR-133856, SASR-20
Contracts NGL-05-020-014, SEL PROJ. 3208

Descriptors: *Aerospace environments, *Planetary environments, *Radar astronomy, *Radio astronomy, Atmospheric boundary layer, Ionosphere, Planetary atmospheres, Radio transmission.

For abstract, see STAR 1121

N73-31724/0GA PC$3.00/MF$1.45
Specola Vaticana (Vatican City).
ANNUAL REPORT OF THE VATICAN OBSERVATORY, 1972.
1972, 19p
Misc-Original Contains Color Illustrations.

Descriptors: *Astronomical observatories, *Astronomical spectroscopy, *Astronomical telescopes, Celestial mechanics, Research facilities, Stellar spectra.

For abstract, see STAR 1122

N73-31732/3GA PC$3.00/MF$1.45
Scripta Technica, Inc., Washington, D.C.
PROSPECTIVE EXTRA-ATMOSPHERIC ASTRONOMICAL INVESTIGATIONS.
V. G. Kurt. Sep 73, 17p NASA-TT-F-15119
Contract NASW-2484
Tran-Transl. Into English from Priroda (Moscow), No. 5, 1973 p 15-19.

Descriptors: *Equipment specifications, *Spaceborne telescopes, Astronomical observatories, Astronomical telescopes.

For abstract, see STAR 1122

N73-31760/4GA PC$3.00/MF$1.45
Royal Observatory, Edinburgh (Scotland).
REPORT OF THE ASTRONOMER ROYAL FOR SCOTLAND FOR THE YEAR ENDING 31 MARCH 1973.
H. A. Brueck. 31 Mar 73, 16p

Descriptors: *Astronomical observatories, *Infrared spectroscopy, *Interstellar extinction, *Scotland, *Stellar spectrophotometry, Astrophysics, Michelson interferometers, Sites, Star clusters, Stellar structure, Ultraviolet photometry.

For abstract, see STAR 1122

3B. Astrophysics

AD-768 495/4GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
INTERFERENCE IN SOLAR OSCILLATIONS,
R. J. Reif, and Steven Musman. 17 May 71, 11p Rept no. AFCRL-TR-0581
Availability: Pub. in Solar Physics, v20 p257-263 1971.

Descriptors: (*Solar spectrum, Oscillation), Iron, Line spectrum, Solar disturbances, Power spectra.

The authors have analyzed magnetograph observations of the 5-min oscillations. It was found that most of the oscillatory power is concentrated in space and frequency. Interference effects where these concentrations overlap can explain some of the variations in amplitude of the oscillation. (Author)

AD-768 496/2GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
MEASUREMENTS OF THE LIMB DARKENING IN THE FORBIDDEN MG I LINE AT 4571.1A,
O. R. White, R. C. Altrock, J. W. Brault, and C. D. Slaughter. 13 Sep 71, 10p Rept no. AFCRL-TR-73-0582
Also available as NCAR-Reprint-824.
Availability: Pub. in Solar Physics, v23 p18-25 1972.

Descriptors: (*Solar spectrum, Magnesium), Spectra(Visible + ultraviolet), Electron transitions, Line spectrum, Solar atmosphere, Selection rules.

The authors report high resolution measurements of the center-to-limb variation of the MgI line at 4571.1A. This forbidden line is of interest because it should be formed in LTE. Comparison of measurements with the Harvard-Smithsonian Reference Atmosphere show that the line center radiation originates in the temperature minimum region from 330 to 550 km above the point where tau(continuum)=1. Observations near the limb confirm that the temperature minimum is approximately 4200K. (Author)

AD-768 498/8GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
OBSERVATIONS OF THE CORONAL NETWORK,
George W. Simon, and Robert W. Noyes. 1971, 5p Rept no. AFCRL-TR-73-0580
Availability: Pub. in Solar Magnetic Fields, p663-666 1971.

Descriptors: (*Solar atmosphere, Magnetic fields), (*Solar spectrum, Spectra(Visible + ultraviolet)), Calcium, Oxygen, Chromosphere, Correlation techniques, Solar corona.
Identifiers: OSO-G satellite, Far ultraviolet radiation, Photosphere.

Spectroheliograms of quiet regions obtained by the OSO-G satellite in chromospheric, transition zone, and coronal lines indicate that the chromospheric network as seen in a Ca K can be resolved despite the low resolution (30 arc s) of OSO-G. The network pattern becomes more diffuse with increasing height, indicating that the magnetic field pattern spreads with height. (Author)

AD-768 620/7GA PC$3.00/MF$1.45
Arizona Univ Tucson
GROUNDBASED INFRARED MEASUREMENTS.
Final rept. 14 Aug 69-May 73,
Frank J. Low. 5 Jun 73, 26p AFCRL-TR-73-0371
Contract F19628-70-C-0046, ARPA Order-1366

Descriptors: (*Astronomical data, Infrared spectroscopy), Statistical data, Tables.
Identifiers: *Infrared stars.

The report describes the results of a groundbased sky survey at 10 micrometers, an attempt to verify and study previously unknown sources detected by the AFCRL HI STAR rocket survey, and the results of an absolute calibration of stellar fluxes. (Author)

AD-768 633/0GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE FORMATION OF MG I 4571 A IN THE SOLAR ATMOSPHERE. II. THE EFFECT OF ONE-DIMENSIONAL MACROSCOPIC VELOCITY FIELDS,
Richard C. Altrock, and C. J. Cannon. 23 Jan 73, 13p Rept no. AFCRL-TR-73-0584
Revision of report dated 8 Nov 72. See also report dated 15 Mar 72, AD-756 751.
Availability: Pub. in Solar Physics, v29 p275-286 1973.

Descriptors: (*Solar spectrum, Magnesium), Solar atmosphere, Atmosphere models, Spectra(Visible + ultraviolet).

An analysis of the 4571 A line of neutral magnesium is presented in which one-dimensional macroscopic velocity fields are included. It is shown that gradients over restricted heights in the vertical and horizontal components of the velocity field of order-0.005/s and -0.004/s (such that velocity towards the observer decreases as height increases), respectively, result in asymmetries in the computed line profile similar to those observed. The heights in the solar atmosphere at which these velocity gradients exist are shown to be very critical in reproducing the observations. It was found that the best results were obtained when the gradients existed in the height range from approximately 200 km to approximately 300 km below the temperature minimum. The results indicate that for the Mg I 4571 A line model calculations that do not include one-dimensional flow velocities may safely be compared with frequency-averaged observations. (Author)

AD-769 053/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
DEVICE FOR RECORDING DATA FROM A SOLAR MAGNETOGRAPH AND THE DATA INPUT TO A COMPUTER,
S. C. Bormnik, L. V. Granitskii, and B. F. Oask. 9 Oct 73, 10p Rept no. FSTC-HT-23-296-74
Edited trans. of Novaya Tekhnika v Astronomii (USSR) n4 p41-45 1972, by Kathleen L. Dion.

Descriptors: (*Solar atmosphere, Data processing systems), Digital recording systems, Magnetic fields, Analog-to-digital converters, USSR.

The report describes specially developed piece of equipment for the digital recording of data from a three-component solar magnetograph and for its computer input and control of the magnetograph.

COM-73-11766/5GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Environmental Research Labs.
GROUND-BASED OBSERVATIONS OF EUV FLARE EMISSIONS,
Richard F. Donnelly. 1973, 20p NOAA-73092708
Pub. in Proceedings of Symposium on High Energy Phenomena on the Sun, NASA X-693-73-193, NASA Goddard Space Flight Center, Greenbelt, Md. May 73, p242-261.

Descriptors: (*Solar flares, Solar ultraviolet radiation), Far ultraviolet radiation, Solar x rays, Magnetic fields, Sudden ionospheric disturbances.

Ground-based observations have established that impulsive extreme-ultraviolet (EUV) flashes occur during solar flares, in close association with hard X-ray bursts and certain impulsive portions of the optical flare. The energy flux radiation in the 10 to 1030 A wavelength range exceeds that in hard X-rays by about 100 thousand, and is roughly comparable to the energy flux radiated at all optical wavelengths. In this paper our current knowledge of EUV flare radiation and ground-based observations of the radiations are reviewed. Several hypotheses are proposed about the interrelation

between impulsive EUV emissions and other flare radiations, their spatial location, and association with magnetic fields. (Author)

COM-73-11777/2GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Space Environment Lab.
ON THE THERMAL CONDUCTIVITY OF THE QUIET SOLAR-WIND PLASMA AND CONSEQUENCES,
S. Cuperman, and N. Metzler. 28 Nov 72, 16p
NOAA-73092712
Revision of report dated 8 Aug 72. Prepared in cooperation with Tel-Aviv Univ., Ramat (Israel).
Pub. in the Astrophysical Jnl., v182 p961-975, 15 Jun 73.

Descriptors: (*Solar wind, Plasmas(Physics)), Aerospace environment, Magnetic fields, Thermal conductivity.
Identifiers: Interplanetary magnetic field.

The structure, space dependence and consequences of an anomalously low (electron) thermal conductivity in the quiet solar wind are investigated. The solar wind is described by fluid equations but the thermal conductivity includes effects coming from both the inhibition of heat transport across the spiraling interplanetary magnetic field and electromagnetic turbulence (noncollisional processes). The importance of the reduction of the thermal conductivity at mainly low heliocentric distances is indicated. This kind of reduction is necessary to reproduce the actual state of the quiet solar wind. The paper is supplemented by a physical discussion of the problem. (Modified author abstract)

COM-73-11778/0GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Space Environment Lab.
ON THE ROLE OF FLUCTUATIONS IN THE INTERPLANETARY MAGNETIC FIELD OF HEAT CONDUCTION IN THE SOLAR WIND,
S. Cuperman, and N. Metzler. 24 Jan 73, 3p
NOAA-73092713
Revision of report dated 13 Nov 72.
Pub. in Jnl. of Geophysical Research, v78 n16 p3167-3168, 1 Jun 73.

Descriptors: (*Solar wind, Thermal conductivity), Aerospace environment, Magnetic fields.
Identifiers: *Interplanetary magnetic fields.

In the study of the role of fluctuations in the interplanetary magnetic field on heat conduction in the solar wind, the authors find that the main reduction of the thermal conductivity should occur at low heliocentric distances. The main reason is that the temperature and heat flux through one AU depend on the relative importance of the transport of energy by conduction at low heliocentric distances and at larger heliocentric distances.

ESRO-SP-74/GA PC$7.50/MF$1.45
European Space Research Organization, Paris (France).
HEOS-1 SATELLITE. SOME PRELIMINARY SCIENTIFIC RESULTS. PROCEEDINGS OF A COLLOQUIUM, SACLAY, 21--23 APRIL 1971.
Mar 72, 107p CONF-710468-
In English and French. U.S. Sales Only.

Descriptors: (*Sun, *Meetings), Research programs, Satellites.

For abstract, see NSA 28 08, number 19263.

N-73-17829/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
LOW ENERGY COSMIC RAY PROTONS FROM NUCLEAR INTERACTIONS OF COSMIC RAYS WITH THE INTERSTELLAR MEDIUM.
H. T. Wang. Feb 73, 15p NASA-TM-X-66181

Descriptors: (*Secondary cosmic radiation, *Interstellar space), (*Protons, Secondary cosmic radiation), (*Proton-proton interactions, *Cross sections), (*Helium 4, *Proton reactions), Mev range 01-10, Mev range 10-100.

For abstract, see NSA 28 08, number 19193.

N-73-17830/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
PRIMARY COSMIC RAY ELECTRONS ABOVE 10 GEV: EVIDENCE FOR A SPECTRAL BREAK.
R. F. Silverberg, J. F. Ormes, and V. K. Balasubrahmanyan. Jan 73, 23p NASA-TM-X-66182

Descriptors: (*Electrons, Primary cosmic radiation), (*Primary cosmic radiation, *Energy spectra), Cascade showers, Gev range 01-10, Gev range 10-100, Gev range 100-1000, Protons, Shape.

For abstract, see NSA 28 08, number 19194.

N-73-17843/GA PC$5.45/MF$1.45
Gca Corp., Bedford, Mass. Gca Technology Div.
MARCH 7, 1970 SOLAR ECLIPSE INVESTIGATION. FINAL REPORT.
C. A. Accardo. Oct 72, 81p NASA-CR-130698, GCA-TR-72-1
Contract NASw-1993

Descriptors: (*Sun, *Eclipse), (*X radiation, *Solar radiation), (*D region, *Ionization), (*E region, Ionization), Electric fields.

For abstract, see NSA 28 08, number 19270.

N-73-17844/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, New York. Goddard Inst. For Space Studies.
SOLAR NEUTRINOS AND THE INFLUENCES OF OPACITY, THERMAL INSTABILITY, ADDITIONAL NEUTRINO SOURCES, AND A CENTRAL BLACK HOLE ON SOLAR MODELS.
R. B. Stothers, and D. Ezer. (1972)4 14p NASA-TM-X-68847

Descriptors: (*Solar radiation, *Flux density), (*Neutrinos, Solar radiation), (*Black holes, *Sun), Emission, Instability, Opacity, Temperature dependence, Zones.

For abstract, see NSA 28 08, number 19271.

N-73-17846/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, New York. Goddard Inst. For Space Studies.
EVOLUTION OF STARS WITH SUPPRESSED CORE CONVECTION.
R. B. Stothers, and C. W. Chin. (1972)5 15p NASA-TM-X-68944

Descriptors: (*Star evolution, *Convection), Helium, Magnetic fields, Stars, Thermonuclear reactions, Zones.

For abstract, see NSA 28 08, number 19205.

N-73-17847/GA PC$4.00/MF$1.45
Maryland Univ., College Park. Dept. Of Physics and Astronomy.
STOCHASTIC MODEL OF THE GALACTIC MAGNETIC FIELD.
T. B. Kaiser. Sep 72, 25p NASA-CR-130158

Descriptors: (*Milky way, *Magnetic fields), Mathematical models, Stochastic processes.

For abstract, see NSA 28 08, number 19303.

N-73-18816/GA PC$5.45/MF$1.45
Iowa Univ., Iowa City. Dept. Of Physics and Astronomy.
SHORT-DURATION SOLAR MICROWAVE BURSTS AND ASSOCIATED SOFT X-RAY EMISSION.
S. R. Spangler. Dec 72, 104p NASA-CR-130859
Contract N00014-68-A-0196-0003

Descriptors: (*Solar radio bursts, *Correlations), (*Solar x-ray bursts, Correlations), (*Solar flares, Correlations), Acceleration, Electrons, Energy, Ghz range 01-100.

For abstract, see NSA 28 08, number 19272.

N-73-18819/GA PC$4.00/MF$1.45
Minnesota Univ., Minneapolis. School of Physics and Astronomy.
GAMMA RAY EMISSION FROM THE REGION OF THE GALACTIC CENTER. COSMIC PHYSICS REPORT.
G. H. Dahlbacka, P. S. Freier, and C. J. Waddington. Sep 72, 23p NASA-CR-130863
Contract N00014-67-A-0113-0021

Descriptors: (*Milky way, *Gamma radiation), (*Cosmic gamma sources, *Flux density), Emission, Zones.

For abstract, see NSA 28 08, number 19304.

N-73-18824/GA PC$4.00/MF$1.45
California Univ., Berkeley.
IDENTIFICATION OF THE X-RAY PULSAR IN HERCULES: A NEW OPTICAL PULSAR.
A. Davidsen, J. P. Henry, J. Middleditch, and H. E. Smith. 1972, 14p NASA-CR-130923

Descriptors: (*Binary stars, *Correlations), (*Pulsars, Correlations), Pulses, Variations, Visible radiation, X radiation.

For abstract, see NSA 28 08, number 19242.

N-73-19703/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
ULTRAHIGH ENERGY PHOTON SPECTRUM.
F. W. Stecker, and J. Bredekamp. Dec 72, 10p NASA-TM-X-66198

Descriptors: (*Primary cosmic radiation, *Energy spectra), (*Photons, Primary cosmic radiation), Energy range, Nucleons, Numerical solution.

For abstract, see NSA 28 08, number 19195.

N-73-19864/GA PC$4.00/MF$1.45
Stanford Univ., Calif. Inst. For Plasma Research.
LUMINOSITY FUNCTION OF QUASARS AND ITS EVOLUTION: A COMPARISON OF OPTICALLY SELECTED QUASARS AND QUASARS FOUND IN RADIO CATALOGS.
V. Petrosian. Jan 73, 48p NASA-CR-131111, SU-IPR-502

Descriptors: (*Quasars, *Luminosity), Cosmology, Distribution, Doppler effect, Radiowave radiation, Visible radiation.

For abstract, see NSA 28 08, number 19243.

NP-19816/GA PC$4.25/MF$1.45
Department of Supply, Mildura (Australia). Balloon Launching Station.
EQUIPMENT AND FACILITIES AVAILABLE FOR FLYING BALLOON-BORNE SCIENTIFIC EXPERIMENTS.
May 73, 41p
U.S. Sales Only.

Descriptors: (*Balloons, *Launching), Astrophysics, Cosmic radiation, Electronic equipment, Manuals, Measuring instruments, Telemetry, Victoria.

For abstract, see NSA 28 07, number 16223.

N73-30117/8GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MOTION OF THE SOURCES FOR TYPE 2 AND TYPE 4 RADIO BURSTS AND FLARE-ASSOCIATED INTERPLANETARY DISTURBANCES.
K. Sakurai, and J. K. Chao. Aug 73, 16p NASA-TM-X-70452, X-693-73-247

Descriptors: *Interplanetary space, *Shock waves, *Solar flares, *Type 2 bursts, *Type 4 bursts, Geomagnetism, Magnetic storms, Wave propagation.

For abstract, see STAR 1121

N73-30217/6GA PC$4.25/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
THE JET PROPULSION LABORATORY 7.62-M SPACE SIMULATOR MODIFICATION.
N. R. Morgan. 1 Sep 73, 43p NASA-CR-133791, JPL-TM-33-639
Contract NAS7-100

Descriptors: *Mercury (Planet), *Solar flux, *Space simulators, Helios project, Mariner spacecraft, Test facilities.

For abstract, see STAR 1121

N73-30235/8GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A REVERSE SHOCK ASSOCIATED WITH A STREAM-STREAM INTERACTION: THE 29TH FEBRUARY 1968 EVENT.
J. K. Chao, R. P. Lepping, and J. Binsack. Aug 73, 24p NASA-TM-X-70451, X-692-73-246

Descriptors: *Cosmic plasma, *Explorer 33 satellite, *Explorer 35 satellite, *Interplanetary magnetic fields, *Shock waves, Pioneer 8 space probe, Shock wave interaction, Solar wind.

For abstract, see STAR 1121

N73-30768/8GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
CONSISTENCY OF COSMIC-RAY SOURCE ABUDANCES WITH EXPLOSIVE NUCLEOSYNTHESIS.
B. Kozlovsky, and R. Ramaty. Aug 73, 14p NASA-TM-X-70448, X-660-73-237

Descriptors: *Abundance, *Cosmic rays, *Nuclear fusion, Astronomical models, Elements, Solar system.

For abstract, see STAR 1121

N73-30769/6GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AN EMPIRICAL MODEL OF ENERGETIC SOLAR PROTON FLUXES WITH APPLICATIONS TO EARTH ORBITING SPACECRAFT.
E. G. Stassinopoulos, and J. H. King. Dec 72, 33p NASA-TM-X-70433, X-601-72-489
Subm-Submitted for Publication.

Descriptors: *Aerospace vehicles, *Mathematical models, *Proton flux density, *Solar flux, *Solar protons, Astronomical maps, Earth orbits, Particle density (Concentration), Spacecraft trajectories.

For abstract, see STAR 1121

N73-30770/4GA PC$5.50/MF$1.45
General Electric Co., Schenectady, N.Y. Physics and Electrical Engineering Lab.
LUNAR SURFACE COSMIC RAY EXPERIMENT S-152, APOLLO 16.
Final Report.
R. L. Fleischer, H. R. Hart, Jr., M. Carter, G. M. Comostock, and A. Renshaw. 25 Jul 73, 67p NASA-CR-134019
Contract NAS9-11468

Descriptors: *Apollo 16 flight, *Cosmic rays, *Lunar topography, Energy spectra, Nuclei (Nuclear physics), Radiation counters, Solar flares, Solar system.

For abstract, see STAR 1121

N73-30773/8GA PC$3.75/MF$1.45
Stanford Univ., Calif. Inst. for Plasma Research.
INFLUENCE OF SOLAR MAGNETIC SECTOR STRUCTURE ON TERRESTRIAL ATMOSPHERE VORTICITY.
Scientific Interim report.
J. M. Wilcox, P. H. Scherrer, L. Svalgaard, W. O. Roberts, and R. H. Olson. Jul 73, 33p NASA-CR-133842, SUIPR-530
Contracts NGR-05-020-559, N00014-67-A-0112-0068

Descriptors: *Solar activity, *Solar magnetic field, *Vorticity, Northern hemisphere, Stratosphere, Troposphere, Winter.

For abstract, see STAR 1121

N73-30775/3GA PC$3.00/MF$1.45
Hale Observatories, Pasadena, Calif. Big Bear Solar Observatory.
SUNSPOT MOTION AND FLARING IN M482.
B. Lazareff, and H. Zirin. 1971, 18p NASA-CR-133848, BBSO-0130
Contracts NSR-05-002-071, NSF GA-24015

Descriptors: *Solar flares, *Sunspots, H alpha line, Solar radiation, Type 3 bursts.

For abstract, see STAR 1121

N73-30776/1GA PC$3.75/MF$1.45
Maryland Univ., College Park. Inst. for Fluid Dynamics and Applied Mathematics.
STABILIZATION OF ELECTRON STREAMS IN TYPE 3 SOLAR RADIO BURSTS.
K. Papadopoulos, M. L. Goldstein, and R. A. Smith. May 73, 31p NASA-CR-133844, BN-770
Contract NGR-21-002-005

Descriptors: *Electron beams, *Solar radio bursts, Harmonics, Solar corona.

For abstract, see STAR 1121

N73-30796/9GA PC$5.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
EXPECTED GAMMA-RAY EMISSION SPECTRA FROM THE LUNAR SURFACE AS A FUNCTION OF CHEMICAL COMPOSITION.
R. C. Reedy, J. R. Arnold, and J. I. Trombka. Feb 73, 66p NASA-TM-X-70453, X-641-73-88
Contract NAS9-10670

Descriptors: *Chemical composition, *Emission spectra, *Gamma ray beams, *Lunar radiation, Apollo 15 flight, Apollo 16 flight, Flux density, Inelastic scattering, Neutron emission, Radioactivity.

For abstract, see STAR 1121

N73-30798/5GA PC$4.50/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FEASIBILITY OF MINING LUNAR RESOURCES FOR EARTH USE: CIRCA 2000 AD. VOLUME I: SUMMARY.
K. Nishioka, R. D. Arno, A. D. Alexander, and R. E. Slye. Aug 73, 49p NASA-TM-X-62267
Seri-2.

Descriptors: *Lunar rocks, *Lunar soil, *Mineral deposits, *Mining, Industrial management, Lunar geology, Lunar logistics, Space transportation.

For abstract, see STAR 1121

N73-30799/3GA PC$10.25/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
FEASIBILITY OF MINING LUNAR RESOURCES FOR EARTH USE: CIRCA 2000 AD. VOLUME 2: TECHNICAL DISCUSSION.
K. Nishioka, R. D. Arno, A. D. Alexander, and R. E. Slye. Aug 73, 161p NASA-TM-X-62268
Seri-2.

Descriptors: *Lunar rocks, *Lunar soil, *Management planning, *Mineral deposits, *Mining, Equipment specifications, Operations research, Production engineering, Production planning.

For abstract, see STAR 1121

N73-30801/7GA PC$8.00/MF$1.45
Techtran Corp., Silver Spring, Md.
FOR LUNAR ROCK.
V. Alekseyev, L. Lebedev, and G. S. Narimanov. Sep 73, 119p NASA-TT-F-14983
Contract NASW-2485
Tran-Transl. Into English of the Publ. "Za Lunnym Kammem" Moscow, Mashinostr., 1972 120 p.

Descriptors: *Lunar probes, *Lunar topography, *U.s.s.r. space program, Lssm, Lunar surface vehicles, Lunik 16 lunar probe.

For abstract, see STAR 1121

N73-30802/5GA PC$4.25/MF$1.45
Specola Vaticana (Vatican City).
VV 428-479 VARIABLE STARS IN A CEPHEUS-LACERTA FIELD OF THE MILKY WAY.
Ricerche Astronomiche, Vol. 8, No. 18.
W. J. Miller, and A. A. Wachmann. 1973, 42p

Descriptors: *Milky way galaxy, *Variable stars, Curvature, Light (Visible radiation), Tables (Data).

For abstract, see STAR 1121

N73-30803/3GA PC$4.25/MF$1.45
Royal Greenwich Observatory, Herstmonceux (England).
LINE STRENGTHS IN THE SPECTRA OF SEVEN DOUBLE-LINED AM BINARY STARS.
D. J. Stickland. 1972, 41p BULL-177

Descriptors: *Binary stars, *Line spectra, A stars, Spectrum analysis, Tables (Data).

For abstract, see STAR 1121

N73-30804/1GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
EMPLACEMENT OF THE CAYLEY FORMATION.
V. R. Oberbeck, F. Hoerz, R. H. Morrison, and W. L. Quaide. Sep 73, 54p NASA-TM-X-62302

Descriptors: *Lunar craters, *Volcanology, Ejection, Sampling.

For abstract, see STAR 1121

N73-30805/8GA PC$14.75/MF$1.45
Stanford Univ., Calif.
PROJECT CYCLOPS: A DESIGN STUDY OF A SYSTEM FOR DETECTING EXTRATERRESTRIAL INTELLIGENT LIFE.
1971, 253p NASA-CR-114445

Contract NGT-05-020-409

Descriptors: *Extraterrestrial life, *Life detectors, *Signal detection, Antennas, Electromagnetic radiation, Pattern recognition, Radio communication.

For abstract, see STAR 1121

N73-30806/6GA PC$3.00/MF$1.45
General Electric Co., Schenectady, N.Y. Physics and Electrical Engineering Lab.
INVESTIGATIONS OF LUNAR MATERIALS.
Final Report, 1 Feb. - 31 Jul. 1973.
R. L. Fleischer, and H. R. Hart, Jr.. 31 Jul 73, 17p
NASA-CR-134023, SRD-73-126
Contract NAS9-11583

Descriptors: *Lunar rocks, *Particle trajectories, Cosmic rays, Erosion, Sampling, Soils.

For abstract, see STAR 1121

N73-30807/4GA PC$1.25/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
LIFE BEYOND EARTH AND THE MIND OF MAN.
Symposium Proceedings (Abridged).
R. Berendzen. 1973, 110p NASA-SP-328, LC-73-600150
Conf-Symp. Held in Boston, 20 Nov. 1972.

Descriptors: *Conferences, *Extraterrestrial life, *Social factors, Celestial bodies, Extraterrestrial radio waves, Philosophy, Radio telescopes.

For abstract, see STAR 1121

N73-30808/2GA PC$5.75/MF$1.45
RAND Corp., Santa Monica, Calif.
MARINER 9 CONTROL NET OF MARS, APRIL 1973.
M. E. Davis. Apr 73, 73p NASA-CR-133845, R-1266-JPL
Contract JPL-953011
Subm-Sponsored in Part by NASA Prepared for JPL.

Descriptors: *Geodetic surveys, *Mariner 9 space probe, *Mars (Planet), *Television systems, Control theory, Geodetic coordinates, Mapping, Photogrammetry.

For abstract, see STAR 1121

N73-30810/8GA PC$4.25/MF$1.45
Kansas State Univ., Manhattan. Dept. of Physics.
INFRARED LABORATORY STUDIES OF SYNTHETIC PLANETARY ATMOSPHERES.
Semiannual Status Report, 1 Dec. 1972 - 31 May 1973.
D. Williams. 14 Jun 73, 45p NASA-CR-133855
Contract NGR-17-001-026

Descriptors: *Atmospheric composition, *Infrared radiation, *Planetary atmospheres, Absorption spectra, Ammonia, Line spectra, Nitrous oxides.

For abstract, see STAR 1121

N73-30817/3GA PC$3.00/MF$1.45
Osservatorio Astronomico, Rome (Italy).
SOLAR PHENOMENA.
Monthly Bulletin, Oct. 1972.
M. Cimino. Oct 72, 14p BULL-174

Descriptors: *Astronomical observatories, *Sunspots, Italy, Periodic variations, Solar magnetic field, Solar spectra, Tables (Data).

For abstract, see STAR 1121

N73-30818/1GA PC$3.00/MF$1.45
Osservatorio Astronomico, Rome (Italy).
SOLAR PHENOMENA.
Monthly Bulletin, Nov. 1972.
M. Cimino. Nov 72, 9p BULL-175

Descriptors: *Astronomical observatories, *Sunspots, Italy, Periodic variations, Solar magnetic field, Solar spectra, Tables (Data).

For abstract, see STAR 1121

N73-30819/9GA PC$4.25/MF$1.45
Royal Greenwich Observatory, Herstmonceux (England).
LINE STRENGTHS IN THE SPECTRA OF SEVEN DOUBLE-LINED AM BINARY STARS.
D. J. Strickland. Aug 72, 41p ROY-OBS-BULL-177

Descriptors: *Binary stars, *Spectral line width, *Stars, *Stellar spectra, Spectrograms, Spectrum analysis.

For abstract, see STAR 1121

N73-30923/9GA PC$5.00/MF$1.45
Colorado Univ., Boulder. Lab. for Atmospheric and Space Physics.
PLANETARY ATMOSPHERIC PHYSICS AND SOLAR PHYSICS RESEARCH.
Annual Report, 1972-1973.
Jun 73, 58p NASA-CR-133773
Contracts NGL-06-003-052, NGL-06-003-064

Descriptors: *Planetary atmospheres, *Solar physics, *Spaceborne astronomy, Experimental design, Research projects, Ultraviolet spectrometers.

For abstract, see STAR 1121

N73-31090/6GA PC$5.50/MF$1.45
National Research Council of Canada, Ottawa (Ontario).
INVESTIGATION OF LOCAL REGIONS OF SOLAR RADIO RADIATION BY POLARIZATION OBSERVATIONS IN THE MICROWAVE BAND.
D. V. Korolkov, N. S. Soboleva, and G. B. Gelfreikh. 1973, 69p NRC-TT-1681
Tran-Transl. Into English from Izv. Gl. Astron. Observ. Pulkove (Ussr), V. 21, No. 164, 1960 p 81-112.

Descriptors: *Polarized electromagnetic radiation, *Solar eclipses, *Solar radio emission, Polarization characteristics, Radio receivers, Test equipment.

For abstract, see STAR 1122

N73-31352/0GA PC$3.00/MF$1.45
Analytical Mechanics Associates, Inc., Seabrook, Md.
AN ESTIMATE OF PARTICLE FLUX FROM PIONEER 8 AND 9 PART 2.
Final Report.
H. Wolf. Feb 73, 5p NASA-CR-132798, AMA-73-4-PT-2
Contract NAS5-11978

Descriptors: *Flux (Rate), *Impact, *Particles, *Pioneer 8 space probe, *Pioneer 9 space probe, Mathematical models, Particle flux density.

For abstract, see STAR 1122

N73-31405/6GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE PIONEER 11 HIGH-FIELD FLUXGATE MAGNETOMETER.
M. H. Acuna, and N. F. Ness. Sep 73, 73p NASA-TM-X-70467, X-692-73-268
Subm-Submitted for Publication.

Descriptors: *Jupiter probes, *Magnetic fields, *Magnetometers, *Pioneer 11 space probe, Magnetosphere, Radiation belts, Solar wind.

For abstract, see STAR 1122

N73-31707/5GA PC$5.75/MF$1.45
Aerospace Corp., El Segundo, Calif.
SOLAR FLARE PREDICTIONS AND WARNINGS.
Final Report.
K. P. White, Iii, and E. B. Mayfield. 6 Jul 73, 71p
NASA-CR-114635
Contract NAS2-7292

Descriptors: *Rocket launching, *Solar flares, *Solar radio emission, Forecasting, Mapping, Radio waves.

For abstract, see STAR 1122

N73-31709/1GA PC$3.75/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
STEADY-STATE FLOW OF THE SOLAR WIND AROUND A DIPOLE.
M. L. Brailovskiy, and L. S. Frank. 10 Sep 73, 31p
NASA-TT-F-15071, PR-77
Contract NASW-2483
Tran-Transl. Into English from Statsionarnoye Obtekaniye Dipolya Solnechnym Vetrom (Moscow), 1971 31 p. Misc-Previously Announced as N72-13754.

Descriptors: *Dipoles, *Earth (Planet), *Magnetic fields, *Solar wind, Equations of motion, Mathematical models, Numerical analysis.

For abstract, see STAR 1122

N73-31710/9GA PC$3.75/MF$1.45
Stanford Univ., Calif. Inst. for Plasma Research.
IMPULSIVE SOLAR X-RAY BURSTS: BREMSSTRAHLUNG RADIATION FROM A BEAM OF ELECTRONS IN THE SOLAR CHROMOSPHERE AND THE TOTAL ENERGY OF SOLAR FLARES.
V. Petrosian. Jun 73, 31p NASA-CR-133943, SU-IPR-528
Contract NGL-05-020-272

Descriptors: *Bremsstrahlung, *Chromosphere, *Electron beams, *Solar flares, Electromagnetic radiation, Photosphere, X rays.

For abstract, see STAR 1122

N73-31711/7GA PC$3.00/MF$1.45
Washington Univ., St. Louis, Mo. Dept. of Physics.
ISOTOPIC COMPOSITION OF HEAVY COSMIC RAYS.
R. C. Maehl, M. H. Isreal, and J. Klarmann. 1973, 14p NASA-CR-135516
Contract NGR-26-008-001

Descriptors: *Balloon sounding, *Cosmic rays, *Ionization chambers, *Isotopes, Calcium isotopes, Geomagnetism, Isotopes, Silicon isotopes, Sulfur isotopes.

For abstract, see STAR 1122

N73-31731/5GA PC$5.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE GUM NEBULA AND RELATED PROBLEMS.
1973, 246p NASA-SP-332
Conf-Symp. Held at Greenbelt, MD., 18 May 1971.

Descriptors: *Astronomical observatories, *Celestial bodies, *Conferences, *Nebulae, As-

tronomical photography, Cosmic rays, Explorer 1 satellite, H beta line, Radio astronomy, Stellar mass ejection, Supernovae.

For abstract, see STAR 1122

N73-31742/2GA PC$3.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
NEW FACTS CONCERNING THE COMPOSITION OF THE TUNGUS METEORITE.
N. V. Vasilyev, G. M. Ivanova, and Y. A. Lvov. Sep 73, 7p NASA-TT-F-15125
Contract NASW-2485
Tran-Transl. Into English from Priroda (Moscow), No. 7, Jul. 1973 p 99-101.

Descriptors: *Glass, *Marshlands, *Meteorite craters, *Spherical shells, *Tunguska meteorite, Gas analysis, Gas composition, Materials tests.

For abstract, see STAR 1122

N73-31743/0GA PC$3.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
THE PLASMA IN THE VICINITY OF VENUS. COMPARISON OF THE RESULTS RECEIVED BY MEANS OF VENERA-4 AND MARINER-5.
T. K. Breus, and K. I. Gringauz. 29 Sep 73, 11p NASA-TT-F-15128
Contract NASW-2483
Tran-Transl. Into English from the Publ. "Physics of the Moon and the Planets" Moscow, Nauka, 1972 p 279-283.

Descriptors: *Ionized gases, *Planetary magnetic fields, *Venus atmosphere, Mariner 5 space probe, Plasmas (Physics), Venera 4 satellite, Venus probes.

For abstract, see STAR 1122

N73-31744/8GA PC$3.00/MF$1.45
Techtran Corp., Silver Spring, Md.
PRELIMINARY DATA ON THE LUNAR SOIL BROUGHT BACK BY THE LUNA-20 AUTOMATIC STATION.
A. P. Vingradov. Sep 73, 19p NASA-TT-F-15100
Contract NASW-2485
Tran-Transl. Into English from Priroda (Ussr), No. 8, Aug. 1972 p 2-10.

Descriptors: *Chemical composition, *Lunar soil, *Lunik 20 lunar probe, Anorthosite, Lunar evolution, Lunar rocks.

For abstract, see STAR 1122

N73-31746/3GA PC$5.50/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
WIND TUNNEL STUDIES OF MARTIAN AEOLIAN PROCESSES.
R. Greeley, J. D. Iversen, J. B. Pollack, N. Udovich, and B. White. May 73, 70p NASA-TM-X-62297

Descriptors: *Mariner 9 space probe, *Mars surface, *Wind effects, *Wind tunnel tests, Craters, Erosion, Flow distribution.

For abstract, see STAR 1122

N73-31747/1GA PC$5.75/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
THE 1973 REPORT AND RECOMMENDATIONS OF THE NASA SCIENCE ADVISORY COMMITTEE ON COMETS AND ASTEROIDS.
K. Atkins. 1973, 73p NASA-TM-X-71917

Descriptors: *Asteroids, *Comets, *Recommendations, Comet tails, Spectrometers, X ray diffraction.

For abstract, see STAR 1122

N73-31749/7GA PC$3.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
WHERE AND WHEN DID BORODINO METEORITE FALL .
A. A. Yavnel. Sep 73, 5p NASA-TT-F-15126
Tran-Transl. Into English from Priroda (Moscow), No. 7, Jul. 1973 p 102-103.

Descriptors: *Meteorites, *U.s.s.r., Case histories, Meteoritic composition, Meteoritic microstructures, Phenomenology, Rare gases.

For abstract, see STAR 1122

N73-31753/9GA PC$3.50/MF$1.45
Smithsonian Astrophysical Observatory, Cambridge, Mass.
INVESTIGATION OF ULTRAVIOLET INTERSTELLAR EXTINCTION.
Final Report, 1 Oct. 1972 - 30 Jun. 1973.
C. Payne, and K. L. Haramundanis. Jun 73, 30p NASA-CR-133924, SAO-307-047
Contract NGR-09-015-200

Descriptors: *Interstellar extinction, *Ultraviolet radiation, Celescopes, Error analysis, Least squares method, Nebulae, Wavelengths.

For abstract, see STAR 1122

N73-31754/7GA PC$3.00/MF$1.45
California Inst. of Tech., Pasadena.
RELATIVISTIC STELLAR STABILITY: PREFERRED-FRAME EFFECTS.
W. Ni. 1973, 15p NASA-CR-135517
Contracts NGR-05-002-256, NGR-27-001-035
Subm-Prepared in Cooperation with Mont. State Univ., Bozeman.

Descriptors: *Gravitation theory, *Stellar gravitation, Harmonic analysis, Newton theory, Relativistic effects, Vibrational spectra.

For abstract, see STAR 1122

N73-31755/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Inst. for Space Studies, New York.
FUNDAMENTAL DATA FOR CONTACT BINARIES: RZ COMAE, RZ TAURI, AND AW UMA.
R. E. Wilson, and E. J. Devinney. 1972, 20p NASA-TM-X-69614
Contract NSF GP-18181

Descriptors: *Binary stars, *Gravitational effects, Astronomical models, Light (Visible radiation), Photosphere.

For abstract, see STAR 1122

N73-31756/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
NONDESTRUCTIVE DETERMINATION OF RADIONUCLIDES IN LUNAR SAMPLES USING A LARGE LOW-BACKGROUND GAMMA-RAY SPECTROMETER AND A NOVEL APPLICATION OF LEAST-SQUARES FITTING.
J. S. Eldridge, G. D. Okelly, K. J. Northcutt, and E. Schonfeld. 1972, 8p NASA-TM-X-69581, CONF-720824-1
Subm-Prepared in Cooperation with Ornl.

Descriptors: *Least squares method, *Lunar soil, *Nondestructive tests, *Radioactive isotopes, Apollo flights, Cosmic rays, Gamma rays, Spectroscopy, Spectrum analysis.

For abstract, see STAR 1122

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-768 445/9GA PC$5.75/MF$1.45
Rockwell International Corp Anaheim Calif Electronics Group
CALIBRATION, TEST, FIELD OPERATION AND REFURBISHMENT OF BALLOON BORNE RADIOMETER.
Final rept. 25 Feb 72-30 Jun 73,
Arthur G. DeBell. Jul 73, 74p Rept no. C73-697/201 AFCRL-TR-73-0540
Contract F19628-72-C-0262, ARPA Order-1366

Descriptors: (*Atmospheric sounding, Radiometers), (*Meteorological balloons, *Radiometers), Balloon equipment, Upper atmosphere, Test methods, Calibration, Mechanical drawings, Wiring diagrams.
Identifiers: Cassegrain telescopes.

A cryogenically cooled, filtered infrared radiometer built on a previous contract has been calibrated, installed on a high altitude balloon platform, flown three times and refurbished between flights. This radiometer has several unique features which include the options for the remote operation of two filter wheels each containing six filters at helium temperature, and a rotary chopper which may be run at 200 cycles per second or positioned open. It contains a 10 in. diameter Cassegrain telescope with nine field stops in its focal plane. Each of these field stops is reimaged on a separate detector for stray radiation rejection. The fields of view of the detectors are small and varied in size and shape. The telescope is mounted on a two axis alt azimuth/artillery type/servo operated gimbal which makes sky scans under the control of an on-board programmer. The cryogenically cooled telescope is fitted with an antifrost device which protects the system at altitudes above 35,000 ft. The system is capable of absolute spectral radiometry in bands from 3 to 25 microns. (Author)

AD-768 458/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ESTIMATING ATMOSPHERE TURBIDITY ACCORDING TO ACTINOMETRIC DATA,
E. N. Rusina. 1 Oct 73, 16p Rept no. FTD-HT-23-835-73
Edited trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n254 p190-197 1971, by Paul J. Reiff.

Descriptors: (*Air pollution, USSR), Urban areas, Solar radiation, Periodic variations, Numerical analysis, Wastes(Industrial), Background, Light transmission.
Identifiers: Translations, Turbidity, Seasonal variations, Atmospheric attenuation.

Research indicated that in large cities (such as Leningrad and others) the average annual value of the turbidity factor is 13-28% greater than outside the city, while in the winter months the difference can reach 70%. In the autumn and spring a unique self-purifying of the air occurs in the cities in the middle latitudes, as a result of which the values of the turbidity factor approach those observed outside the city. The annual course of atmospheric turbidity in the cities is entirely different from that outside the city. Besides the maximum in the end of spring - beginning of summer, which is observed both in and out of the city, a second turbidity maximum is seen in the winter in cities, particularly those with a maritime climate.

AD-768 462/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio

TOTAL SPECTRUM OF PARTICLES OF NATURAL AEROSOLS, ESTIMATE OF THE PORTION OF ACTIVE CONDENSATION NUCLEI,
B. G. Andreev. 28 Sep 73, 15p Rept no. FTD-HT-23-65-74
Edited trans. of Vsesoyuznoi Konferentsii po Fizike Oblakov i Aktivnym Vozdeistviyam. Trudy (USSR) v8 p93-100 1970, Victor Mesenzeff.

Descriptors: (*Aerosols, *Particle size), Condensation, Chlorides, Carbonates, Sodium compounds, Magnesium compounds, Calcium compounds, Ammonium compounds, USSR.
Identifiers: *Condensation nuclei, Translations.

AD-768 623/1GA PC$3.50/MF$1.45
Regis Coll Weston Mass
UPPER ATMOSPHERIC AND IONOSPHERIC DATA ANALYSIS FROM DATA RECORDED AT THULE AIR BASE, GREENLAND.
Final rept. 15 Apr 71-30 Jun 73,
Leonarda Burke. 30 Jun 73, 29p AFCRL-TR-73-0501
Contract F19628-71-C-0172

Descriptors: (*Ionospheric disturbances, Polar regions), Aurorae, Statistical data, Tables, Ionospheric propagation, Very low frequency, Greenland.
Identifiers: Thule(Greenland).

Data from the AFCRL Geopole Observatory, Thule, Greenland were scaled from strip charts and placed on IBM cards for computer processing. Tables of the data processed are presented with examples of computer reduced graphic outputs. (Author)

AD-769 060/5GA PC$3.50/MF$1.45
Adaptronics Inc Mclean Va
REFRACTIVE INDEX MEASUREMENTS BY ADAPTIVE TECHNIQUES (RIMDAPT: PHASE 1).
Annual rept. no. 1, 1 Sep 72-31 Aug 73,
Florence w. van Straten, and Roger L. Barron. Sep 73, 63p
Contract N00014-73-C-0103

Descriptors: (*Atmospheric refraction, Refractive index), Measurement, Radar signals, C band.
Identifiers: Ray tracing.

The annual report presents results of a demonstration of the Adaptronics Method for atmospheric refractive index measurements via adaptive inference. It is shown that refractivity profiles computed by this method can provide significant improvement in ray trace accuracy. (Author)

CEA-R-4461/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
ATMOSPHERIC AEROSOL VARIATIONS AS A FUNCTION OF ENVIRONMENT FEATURES.
N. Dupoux. Jul 73, 38p
In French. U.S. Sales Only.

Descriptors: (*Earth atmosphere, Aerosols), (*Aerosols, *Variations), (*Sulfur oxides, *Distribution), Electric charges, Environment, Pollution.

For abstract, see NSA 28 07, number 17734.

COM-73-11634/5GA PC$3.00/MF$1.45
National Oceanic and Atmospheric Administration, Boulder, Colo. Aeronomy Lab.
ACCURATE LANGMUIR PROBE MEASUREMENTS WITH AN ON-LINE COMPUTER.
Technical memo.,
K. H. Geissler, and J. H. Darr. Jun 73, 27p NOAA-73090404, NOAA-TM-ERL-AL-6

Descriptors: (*Atmospheric sounding, Langmuir probes), (*Langmuir probes, Data processing), (*Ionosphere, Electron density), Plasmas(Physics), Electron density(Concentration), Computer programs, FORTRAN.

The report is a study of a method for measuring Langmuir probe characteristics accurately enough to either verify or exclude the hypothesis of non-Maxwellian velocity distributions. Section 2 gives general considerations for the use of Langmuir probes. Section 3 reviews the equations used for evaluating the measured probe characteristics. Sections 4 and 5 outline the data accepting and reduction procedures used. Program listings are given in the Appendix.

COM-73-11744/2GA PC$3.00/MF$1.45
National Oceanic and Atmospheric Administration, Boulder, Colo. Space Environment Lab.
INITIAL EXPLORER 45 SUBSTORM OBSERVATIONS AND ELECTRIC FIELD CONSIDERATIONS.
Technical memo.,
Donald J. Williams, Joseph N. Barfield, and Theodore A. Frits. Jul 73, 33p NOAA-TM-ERL-SEL-25 NOAA-73092806

Descriptors: (*Magnetosphere, Magnetic storms), Protons, Electrons, Electric fields.
Identifiers: Explorer 45 satellite.

The memorandum presents the initial results of a study to determine the behavior of the magnetospheric particle population during substorms at altitudes significantly within geosynchronous orbit. Explorer 45 observations indicate that the gross features of the substorm signature persist deep into the night-side trapping region. However, detailed analysis shows that the static electric field model derived from geostationary observations is unable to explain the injection of substorm associated particle intensities observed by Explorer 45 at 5 to 5.5 R(E) and 2030 to 2230 hours LT. To best fit the observations, the authors obtained an outward electric field component of magnitude approximately 0.81 plus or minus 0.16 mV/m in a corotating coordinate system.

COM-73-11757/4GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Space Environment Lab.
MAGNETOSPHERIC IMPLICATIONS OF THE NONLINEAR WHISTLER INSTABILITY OBTAINED IN A COMPUTER EXPERIMENT,
S. Cuperman, and Y. Salu. 27 Feb 73, 6p NOAA-73092714
Revision of report dated 26 Sep 72. Prepared in cooperation with Tel-Aviv Univ., Ramat Aviv (Israel).
Pub. in Jnl. of Geophysical Research, v78 n22 p4792-4796, 1 Aug 73.

Descriptors: (*Magnetosphere, *Whistlers), Plasmas(Physics), Computerized simulation.

The note deals with studies relating to the rate of growth of whistler waves. The authors performed a computer simulation experiment in which the nonlinear behavior of the plasma system (waves plus particles) was investigated. The calculations confirmed the theoretical predictions for the growth of the whistler instability under the plasma conditions usually encountered in the magnetosphere beyond the plasmapause. The final quasi-equilibrium state observed the computer experiment is suggestive of the quasi-stationary plasma conditions observed in the magnetosphere (geostationary altitudes and equatorial region). Magnetospheric features such as the presence of a cold electron component, spatial nonuniformities, particle gains and losses, and wave reflection and losses should also be incorporated in a computer simulation of the 'global' particle trapping problem.

COM-73-11759/0GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Space Research Lab.
PLASMA INSTABILITIES IN THE MAGNETOSPHERE,
Donald J. Williams. 1972, 12p NOAA-73092707
Pub. in Proceedings of Conference on Solar Terrestrial Relations, University of Calgary, Alberta, Canada, 28 Aug-1 Sep 72 p109-119.

Descriptors: (*Magnetosphere, Plasmas(Physics)), Plasma oscillations, Whistlers, Cyclotron waves, Solar flares.

In his introductory remarks the author indicates that since we are becoming able to identify and understand the dynamic plasma processes in the magnetosphere, we should be encouraged to pursue the difficult task of unravelling the dynamic processes occurring in the solar environment which are responsible for flares and their accompanying phenomena. Two plasma instabilities in the magnetosphere are examined. These are: the drift mirror instability and the ion cyclotron (whistler mode) instability. Various triggering mechanisms for each category of instability are examined.

COM-73-11841/6GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Aeronomy Lab.
ERRORS IN ION AND ELECTRON TEMPERATURE MEASUREMENTS DUE TO GRID PLANE POTENTIAL NONUNIFORMITIES IN RETARDING POTENTIAL ANALYZERS,
Paul D. Goldan, Edward J. Yadlowsky, and Elden C. Whipple, Jr. 26 Dec 72, 11p NOAA-73092710
Revision of report dated 8 Sep 72.
Pub. in Jnl. of Geophysical Research, v78 n16 p2907-2916, 1 Jun 73.

Descriptors: (*Ionosphere, *Ion density(Concentration)), (*Electron energy, Measurement), Ion traps(Instrumentation), Scientific satellites.
Identifiers: OGO 4 satellite.

The behavior of a retarding potential analyzer in a laboratory plasma has been studied to investigate the effects of potential nonuniformities in the grid planes. Significant effects are found for the kind of grids used on the Ogo 1, 3, and 4 traps. It is found that in order to explain the laboratory results the retarding grid potential in the usual planar approximation must be replaced by an effective potential, which may be obtained from the laboratory data. Since the potential distribution about a grid of parallel wires is available analytically, this model is used to calculate the ion current through such a retarding grid. When ion trajectories are taken into account, these calculations show that the effective grid retarding potential is very closely related to the saddle point of the potential near the retarding grid. Applying these corrections to the Ogo 4 O temperatures results in a downward revision of about 32%, bringing them into much better agreement with radar backscatter results. (Author)

COM-73-11853/1GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Environmental Research Labs.
LOW-ENERGY ELECTRON EXPERIMENT FOR ATMOSPHERE EXPLORER-C AND -D,
D. S. Evans, R. A. Hoffman, J. L. Burch, R. W. Janetzke, and J. F. McChesney. 20 Dec 72, 9p NOAA-73092709
Prepared in cooperation with National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
Pub. in Radio Science, v8 n4 p393-400 Apr 73.

Descriptors: (*Upper atmosphere, Charged particles), Protons, Electron energy, Spaceborne detectors, Scientific satellites.
Identifiers: Explorer C satellite, Explorer D satellite.

The low-energy electron experiment will provide differential measurements of the energy influx and angular distributions of electrons and protons on the Atmosphere Explorer-C and -D missions. The detectors consist of cylindrical electrostatic analyzers for species and energy selection and Spiraltron electron multipliers as particle sensors. The C version will contain three detectors, two measuring electrons and protons from 0.2 to 25 kev in 16 logarithmically-spaced steps and one measuring 5 kev electrons continuously. Angular distributions will be acquired using the spin of the spacecraft. The D version will contain 19 detectors, one proton-stepped energy analyzer, and two electron-stepped energy analyzers at two different angles, again over the energy range 0.2 to 25 kev. In addition it will contain 16 fixed-energy detectors which will obtain high time-resolution angular distributions in the spacecraft one-revolution-per-orbit mode at five energies between 0.2 and 5 kev. Increase of these energies by a factor of 3.5 will be possible by ground command. (Author)

COM-73-50870/7GA MF$1.45
National Oceanic and Atmospheric Administration, Princeton, N.J. Geophysical Fluid Dynamics Lab.
A THREE-DIMENSIONAL STRATOSPHERIC POINT-SOURCE TRACER EXPERIMENT AND ITS IMPLICATIONS FOR DISPERSION OF EFFLUENT FROM A FLEET OF SUPERSONIC AIRCRAFT,
J. D. Mahlman. 1973, 7p NOAA-73071718
Presented at AIAA/AMS International Conference on the Environmental Impact of Aerospce Operations in the High Atmosphere, Denver, Colo. 11-13 Jun 73. AIAA Paper No. 73-528.
Paper copy available from American Institute of Aeronautics and Astronautics, 1290 Avenue of the Americas, New York, N.Y. 10019.

Descriptors: (*Air pollution, Atmospheric diffusion), (*Atmospheric circulation, Mathematical models), Lower atmosphere, Stratosphere, Earth models, Supersonic transports, Aerosols, Exhaust gases.

A three-dimensional numerical model has been developed which executes dispersion experiments for passive atmospheric tracers. The model uses winds from a global general-circulation model which contains realistic topography, active water vapor, and seasonally-varying radiation. The horizontal grid spacing is about 265 km. There are eleven vertical levels, the highest at about 31 km. An experiment involving a diffuse point-source release of tracer into the mid-latitude lower stratosphere is described. Based upon the calculated tracer dispersion after eleven months of integration time, estimates of the cumulative effects and implications of a continual buildup of effluent from a supersonic aircraft fleet are presented. The calculations show that local tracer enhancements by a factor of 3800 over the global average of a one-day source are predicted in the source region. (Author)

COO-3425-7/GA PC$10.75/MF$1.45
Fraunhofer-Gesellschaft, Garmisch-Partenkirchen (West Germany). Physikalisch-Bioklimatische Forschungsstelle.
MEASUREMENT OF AIRBORNE RADIOACTIVITY AND ITS METEOROLOGICAL APPLICATION. PART III. ANNUAL REPORT, APRIL 1, 1971--MARCH 31, 1972.
R. Reiter, R. Sladkovic, K. Poetzl, and H. J. Kanter. Feb 73, 172p
Contract AT(11-1)-3425

Descriptors: (*Beryllium 7, *Radiation monitoring), (*Phosphorus 32, Radiation monitoring), (*Phosphorus 33, Radiation monitoring), Bibliographies, Computer calculations, Earth atmosphere, Fallout, German federal republic, Meteorology, Mixing, Radiometric analysis, Sampling, Stratosphere, Sulfur 35, Tracer techniques, Troposphere.

For abstract, see NSA 28 07, number 15481.

N-73-18397/GA PC$5.45/MF$1.45
Iowa Univ., Iowa City. Dept. Of Physics and Astronomy.
TIME VARIATIONS OF MAGNETOSPHERIC INTENSITIES OF OUTER ZONE PROTONS, ALPHA PARTICLES, AND IONS (Z GREATER THAN OR EQUAL TO 2).
B. A. Randall. Jan 73, 73p NASA-CR-130860
Contract NAS1-8141

Descriptors: (*Protons, *Radiation belts), (*Alpha particles, Radiation belts), (*Ions, Radiation belts), (*Magnetosphere, Radiation belts), Energy spectra, Losses.

For abstract, see NSA 28 08, number 19388.

N-73-18423/GA PC$4.00/MF$1.45
California Univ., Berkeley. Space Sciences Lab.
RELATIONSHIP BETWEEN THE GROWTH AND EXPANSION PHASES OF SUBSTORMS AND MAGNETOSPHERIC CONVECTION.
F. S. Mozer. 5 Jul 72, 15p GA-111259, NSF-GA-17328
Contract NAS5-10362

Descriptors: (*Magnetosphere, *Convection), (*Magnetic storms, *Expansion).

For abstract, see NSA 28 08, number 19389.

NP-19814/GA PC$3.50/MF$1.45
Bergen Univ. (Norway). Dept. Of Physics.
PITCH ANGLE DISTRIBUTIONS IN AND NEAR THE LOSS CONE OF (100 TO 350) KEV PROTONS. SCIENTIFIC/TECHNICAL REPORT NO. 52.
R. Amundsen. Jan 73, 28p

Descriptors: (*Protons, *Loss cone), (*Magnetosphere, *Proton precipitation), Charge-exchange reactions, Diffusion, Distribution, Disturbances, Geomagnetic field, Inclination, Interactions, Kev range 100-1000, Lifetime, Scattering, Travelling waves.

For abstract, see NSA 28 07, number 16397.

N73-30331/5GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
HIGH LATITUDE ELECTRIC FIELDS AN THE MODULATIONS RELATED TO INTERPLANETARY MAGNETIC FIELD PARAMETERS.
J. P. Heppner. Jun 73, 44p NASA-TM-X-70444, X-645-73-227
Subm-Submitted for Publication. Conf-Presented at the Chapman Symp. On Magnetospheric Motions, Boulder, Colo., 18-22 Jun. 1973.

Descriptors: *Electric fields, *Interplanetary magnetic fields, *Polar regions, Auroras, Convection, Magnetosphere.

For abstract, see STAR 1121

N73-30336/4GA PC$3.00/MF$1.45
Oslo Univ. (Norway). Inst. of Geophysics.
THE DISTRIBUTION OF ODD NITROGEN IN THE LOWER STRATOSPHERE AND POSSIBLE PERTURBATIONS CAUSED BY STRATOSPHERIC AIR TRANSPORT.
Final Report.
I. S. A. Isaksen, and E. Hesstvedt. Aug 73, 26p
NASA-CR-2314
Contract NGR-52-155-002

Descriptors: *Atmospheric composition, *Atmospheric diffusion, *Atmospheric models, *Nitrogen compounds, *Perturbation, *Stratosphere, Air pollution, Annual variations, Ozone.

For abstract, see STAR 1121

N73-30337/2GA PC$9.75/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
THE DEVELOPMENT OF A STOCHASTIC MODEL OF THE ATMOSPHERE BETWEEN 30 AND 90 KM TO BE USED IN DETERMINING THE EFFECT OF ATMOSPHERE VARIABILITY ON SPACE SHUTTLE ENTRY PARAMETERS.
Ph.D. Thesis - Virginia Polytechnic Inst. and State Univ.
J. W. Campbell. Mar 73, 152p NASA-TM-X-69567

Descriptors: *Atmospheric models, *Monte carlo method, *Space shuttles, *Spacecraft reentry, Parameterization, Stochastic processes, Temperature profiles.

For abstract, see STAR 1121

N73-30342/2GA PC$4.25/MF$1.45
Ionospharen-Institut Breisach (West Germany).
IONOSPHERE DATA, VERTICAL-ECHO-SOUNDING: FREIBURG, URSI-CODE 131, APRIL 1973 IONOSPHAEREN-DATEN VERTIKAL-ECHO-LOTUNG: FREIBURG URSI CODE 131, APRIL 1973.
Apr 73, 44p REPT-322-F
In German and English.

Descriptors: *E region, *F region, *Ionospheric propagation, Balloon sounding, Diurnal variations, Germany, Meteorological charts, Weather forecasting.

For abstract, see STAR 1121

N73-30343/0GA PC$4.25/MF$1.45
Ionospharen-Institut Breisach (West Germany).
IONOSPHERE DATA, VERTICAL-ECHO-SOUNDING: FREIBURG, URSI-CODE 131, MAY 1973 IONOSPHAEREN-DATEN VERTIKAL-ECHO-LOTUNG: FREIBURG URSI CODE 131, MAI 1973.
May 73, 44p REPT-323-F
In German and English.

Descriptors: *E region, *F region, *Ionospheric propagation, Balloon sounding, Diurnal variations, Germany, Meteorological charts, Weather forecasting.

For abstract, see STAR 1121

N73-30344/8GA PC$4.25/MF$1.45
Ionospharen-Institut Breisach (West Germany).
IONOSPHERE DATA, VERTICAL-ECHO-SOUNDING: FREIBURG, URSI-CODE 131, JUNE 1973 IONOSPHAEREN-DATEN VERTIKAL-ECHO-LOTUNG: FREIBURG URSI CODE 131, JUNI 1973.
Jun 73, 44p REPT-324-F
In German and English.

Descriptors: *E region, *F region, *Ionospheric propagation, Balloon sounding, Diurnal variations, Germany, Meteorological charts, Weather forecasting.

For abstract, see STAR 1121

N73-30345/5GA PC$3.75/MF$1.45
Institut d'Aeronomie Spatiale de Belgique, Brussels.
CHEMICAL KINETICS IN THE STRATOSPHERE.
G. Brasseur. 1973, 32p AERONOMICA-ACTA-A-118

Descriptors: *Nitrogen, *Ozone, *Stratosphere, Chemical reactions, Hydrogen, Photodissociation, Reaction kinetics.

For abstract, see STAR 1121

N73-30348/9GA PC$3.25/MF$1.45
Specola Vaticana (Vatican City).
THE ARTIFICIAL NIGHT-SKY ILLUMINATION IN ITALY.
Vatican Observatory Publications, Vol. 1, No. 4.
F. C. Bertiau, E. D. Graeve, and P. J. Treanor. 1973, 21p

Descriptors: *Atmospheric models, *Italy, *Night sky, Light scattering, Mapping.

For abstract, see STAR 1121

N73-30349/7GA PC$3.50/MF$1.45
Stanford Univ., Calif. Inst. for Plasma Research.
ANALYSIS OF THE BACKSCATTER SPECTRUM IN AN IONOSPHERIC MODIFICATION EXPERIMENT.
H. Kim. Jun 73, 27p NASA-CR-133809, SUIPR-509
Contracts NGL-05-020-176, N00014-67-A-0112-0066

Descriptors: *Backscattering, *Ionospheric propagation, High frequencies, Inhomogeneity, Transmitters.

For abstract, see STAR 1121

N73-30351/3GA PC$4.00/MF$1.45
Michigan Univ., Ann Arbor. High Altitude Engineering Lab.
MEASUREMENTS OF THE MICHIGAN AIRGLOW OBSERVATORY FROM 1971 TO 1973 AT ESTER DOME ALASKA.
Final Technical Report.
K. D. Mcwatters, J. W. Meriwether, P. B. Hays, and A. F. Nagy. Jun 73, 40p NASA-CR-124348
Contracts NAS8-28592, ORA PROJ. 011017

Descriptors: *Alaska, *Fabry-perot interferometers, Atmospheric circulation, Atmospheric temperature, Photometers, Temperature measurement.

For abstract, see STAR 1121

N73-30352/1GA PC$6.75/MF$1.45
Bonn Univ. (West Germany). Inst. fuer Astrophysik und Extraterrestrische Forschung.
THE PHASE OF THE 27-DAY VARIATION IN THE UPPER ATMOSPHERE DIE PHASE DER 27-TAGE-VARIATION IN DER HOCHATMOSPHAERE.
G. Paul. Apr 73, 93p BMFT-FB-W-73-10
Contract WRK-49
In German; English Summary.

Descriptors: *Atmospheric density, *Drag measurement, *Reaction time, *Satellite observation, *Twenty-seven day variation, Aerodynamic drag, Cross correlation, Regression analysis, Satellite observation, Spectrum analysis.

For abstract, see STAR 1121

N73-30354/7GA PC$3.75/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
IONOSPHERIC AND COSMIC RAY OBSERVATIONS OBSERVATIONS IONOSPHERIQUES ET DU RAYONNEMENT COSMIQUE BULLETIN MENSUEL, MARS 1973.
Monthly Bulletin, Mar. 1973.
Mar 73, 31p
In French and Dutch.

Descriptors: *Belgium, *Cosmic rays, *Ionospheric sounding, *Neutron flux density, *Tables (Data), E region, F region, Maximum usable frequency.

For abstract, see STAR 1121

N73-30355/4GA PC$3.75/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
IONOSPHERIC AND COSMIC RAY OBSERVATIONS OBSERVATIONS IONOSPHERIQUES ET DU RAYONNEMENT COSMIQUE BULLETIN MENSUEL, AVRIL 1973.
Monthly Bulletin, Apr. 1973.
Apr 73, 31p
In French and Dutch.

Descriptors: *Belgium, *Cosmic rays, *Ionospheric sounding, *Neutron flux density, *Tables (Data), E region, F region, Maximum usable frequency.

For abstract, see STAR 1121

N73-30357/0GA PC$3.50/MF$1.45
Stockholm Univ. (Sweden). Inst. of Meteorology.
A DISCUSSION OF THE CHEMISTRY OF SOME MINOR CONSTITUENTS IN THE STRATOSPHERE AND TROPOSPHERE.
P. Crutzen. Mar 73, 28p AP-12
Subm-Submitted for Publication. Conf-Presented at the Symp. On Atmospheric Ozone and Gen. Circulation in the Stratosphere, Arosa, Switz., 21-25 Aug. 1972.

Descriptors: *Atmospheric chemistry, *Atmospheric composition, *Methane, *Stratosphere, *Troposphere, Atmospheric models, Chemical reactions, Nitrogen oxides, Ozone, Vertical distribution.

For abstract, see STAR 1121

N73-30429/7GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DIRECT INTEGRATION TRANSMITTANCE MODEL.
V. G. Kunde, and W. C. Maguire. Jul 73, 39p NASA-TM-X-70454, X-622-73-258
Subm-Submitted for Publication.

Descriptors: *Planetary temperature, *Spectral resolution, *Thermal emission, *Transmittance, Carbon dioxide, Molecular absorption, Oxygen, Transmitters, Water.

For abstract, see STAR 1121

N73-30698/7GA PC$3.25/MF$1.45
Grambling Coll., La. Dept. of Physics.
STUDY OF LOW FREQUENCY HYDROMAGNETIC WAVES USING ATS-1 DATA.
Semiannual Status Report.
W. D. Cummings. 21 Jun 73, 21p NASA-CR-133847
Contract NGR-19-011-007

Descriptors: *Ats 1, *Micropulsations, Catalogs (Publications), Polarization (Waves), Satellite observation.

For abstract, see STAR 1121

N73-30774/6GA PC$3.25/MF$1.45
Stanford Univ., Calif. Inst. for Plasma Research.
SOLAR ACTIVITY AND THE WEATHER.
L. Svalgaard. Jun 73, 25p NASA-CR-133850, SUIPR-526
Contracts NGR-05-020-559, N00014-67-A-0112-0068
Conf-Presented at the 7TH Eslab Symp., Saulgau, W. Germany, 22-25 May 1973.

Descriptors: *Atmospheric circulation, *Solar activity, *Winter, Geomagnetism, Magnetic fields.

For abstract, see STAR 1121

N73-30777/9GA PC$3.50/MF$1.45
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics.
QUASI-LINEAR APPROACH FOR BOUNCE AND DRIFT RESONANCE INTERACTIONS OF TRAPPED PARTICLES IN THE MAGNETOSPHERE.
T. Ishihara, and T. Tamao. Apr 73, 26p TRITA-EPP-73-09

Descriptors: *Magnetically trapped particles, *Magnetosphere, *Plasma diffusion, *Plasma interactions, *Plasma resonance, Drift rate, Electric fields, Linear equations, Stochastic processes, Transport theory.

For abstract, see STAR 1121

N73-30778/7GA PC$6.50/MF$1.45
Lund Univ. (Sweden). Dept. of Physics.
PHOTOMETRIC MEASUREMENTS ON TRACKS OF VERY HEAVY COSMIC RAY PARTICLES WITH E I GEV/NUCLEON.
R. Andersson, L. Larsson, and O. Mathiesen. Feb 73, 89p LUIP-CR-73-02
Subm-Sponsored in Part by the Swed. Atom Res. Council and the Swed. Nat. Res. Council.

Descriptors: *Balloon flight, *Nuclear emulsions, *Photometers, *Primary cosmic rays, Charge distribution, Identifying, Nuclear particles, Particle trajectories, Relativistic particles, Stochastic processes.

For abstract, see STAR 1121

N73-30797/7GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE DAYSIDE MIDLATITUDE PLASMA TROUGH.
N. J. Miller. Jul 73, 25p NASA-TM-X-70436, X-621-73-181
Subm-Submitted for Publication.

Descriptors: *Electron density (Concentration), *Electron energy, *Electrostatic probes, *Isis satellites, *Plasmapause, Diurnal variations, F region, Photoionization.

For abstract, see STAR 1121

N73-31147/4GA PC$11.00/MF$1.45
Pennsylvania State Univ., University Park. Ionospheric Research Lab.
D-REGION BLUNT PROBE DATA ANALYSIS USING HYBRID COMPUTER TECHNIQUES.
W. J. Burkhard. 28 Jun 73, 177p NASA-CR-135646, PSU-IRL-SCI-415
Contracts NGR-39-009-218, DA-ARO(D)-31-124-72-G158

Descriptors: *Computer techniques, *D region, *Data processing, *Data reduction, *Hybrid computers, Blunt bodies, Computer programs, Space probes.

For abstract, see STAR 1122

N73-31346/2GA PC$3.00/MF$1.45
Tokyo Univ. (Japan). Inst. of Space and Aeronautical Science.
NEUTRAL LINE IN THE MAGNETOTAIL.
A. Nishida. Jul 73, 9p ISAS-497-VOL-38-NO-8

Descriptors: *Geomagnetic tail, *Magnetic storms, *Plasma sheaths, Electron pressure, Lines of force, Magnetic fields, Plasma-electromagnetic interaction.

For abstract, see STAR 1122

N73-31347/0GA PC$4.75/MF$1.45
Tokyo Univ. (Japan). Inst. of Space and Aeronautical Science.

NUMERICAL MODELING OF THE UPPER ATMOSPHERE.
T. Tanaka, and K. Hirao. Jul 73, 52p ISAS-496-VOL-38-NO-7

Descriptors: *Atmospheric models, *Upper atmosphere, Conductive heat transfer, Continuity equation, Diurnal variations, Equations of motion, Ionosphere, Thermosphere, Time dependence.

For abstract, see STAR 1122

N73-31356/1GA PC$4.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
A COMPARISON BETWEEN MEASURED TRANSMISSION AND EMISSION SPECTRA AND CALCULATED SPECTRA IN THE 9.6 MICRON REGION OF OZONE.
D. Marzoch. Sep 73, 36p NASA-TT-F-15110, MBFT-FBW-73-01
Contract NASW-2481
Tran-Transl. Into English of "Ein Vergleich Gemessener Transmissions- und Emisionsspektren MIT Berechneten Spektren in der 9.6 Micron-Bande des Ozons", Lundwig-Maximilians-Univ., Munich, Report Mbft-Fbw-73-01, Jan. 1973 52 p.

Descriptors: *Atmospheric radiation, *Electromagnetic wave transmission, *Ozone, Line spectra, Nimbus 3 satellite.

For abstract, see STAR 1122

N73-31363/7GA PC$9.25/MF$1.45
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
GENERATION AND PROPAGATION OF ELECTROMAGNETIC WAVES IN THE MAGNETOSPHERE.
Ph.D. Thesis.
W. W. L. Taylor. May 73, 145p NASA-CR-133925, U-OF-IOWA-73-16
Contracts NAS1-81414, NAS5-11074

Descriptors: *Extremely low radio frequencies, *Low frequencies, *Magnetosphere, *Mathematical models, *Very low frequencies, Broadband, Spectral emission, Wave generation, Wave propagation.

For abstract, see STAR 1122

N73-31367/8GA PC$6.00/MF$1.45
Lockheed Aircraft Corp., Palo Alto, Calif. Research Lab.
ANALYSIS OF AURORAL PARTICLE FLUXES.
Final Report.
C. R. Chappell. 1 Aug 73, 76p NASA-CR-133889
Contracts NASW-2212, NGR-23-005-015

Descriptors: *Auroras, *Electron precipitation, *Proton precipitation, Angular distribution, Backscattering, Energy spectra, Geomagnetism, Mathematical models, Scattering cross sections.

For abstract, see STAR 1122

N73-31368/6GA PC$12.25/MF$1.45
Ludwig-Maximilians-Universitat, Munich (West Germany). Inst. fuer Meteorologie.
REMOTE SOUNDING OF THE ATMOSPHERE BY OCCULTATION TECHNIQUE. PART 1: INSTRUMENT DEVELOPMENTS AND INFRARED-SPECTROSCOPIC INVESTIGATIONS INDIREKTE SONDIERUNG DER ATMOSPHAERE MITTELS OKKULTATIONSTECHNIK. TEIL 1: INSTRUMENTELLE ENTWICKLUNGEN UND INFRAROTSPEKTROSKOPISCHE UNTERSUCHUNGEN.
H. Bolle, M. Heidemann, A. Leupolt, and W. Voelker. Apr 72, 202p BMBW-FB-W-72-14-PT-1
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
In German; English Summary.

Descriptors: *Infrared filters, *Infrared interferometers, *Occultation, *Rocket sounding, *Vacuum spectroscopy, Atmospheric composition, Atmospheric models, Electromagnetic wave transmission, Interference grating.

For abstract, see STAR 1122

N73-31369/4GA PC$7.00/MF$1.45
Ludwig-Maximilians-Universitat, Munich (West Germany). Inst. fuer Meteorologie.
REMOTE SOUNDING OF THE ATMOSPHERE BY OCCULTATION TECHNIQUE. PART 2: EXPERIMENTAL AND THEORETICAL SPECTRA OF ATMOSPHERIC GASES IN THE INFRARED SPECTRAL REGION INDIREKTE SONDIERUNG DER ATMOSPHAERE MITTELS OKKULTATIONSTECHNIK. TEIL 2: EXPERIMENTELLE UND THEORETISCHE SPEKTREN ATMOSPHAERISCHER GASE IM INFRAROTEN SPEKTRALBEREICH.
A. Leupolt. Apr 72, 97p BMBW-FB-W-72-14-PT-2
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
Language in German.

Descriptors: *Atmospheric composition, *Infrared spectra, *Occultation, *Rocket sounding, Ammonia, Carbon dioxide, Carbon monoxide, Graphs (Charts), Hydrocarbons, Infrared filters, Infrared interferometers, Nitric oxide, Vacuum spectroscopy.

For abstract, see STAR 1122

N73-31371/0GA PC$7.00/MF$1.45
Bonn Univ. (West Germany). Inst. fuer Physik.
NEUTRAL PARTICLE DENSITIES AND TEMPERAURE MEASUREMENTS IN THE LOWER WINTER THERMOSPHERE AT POLAR LATITUDES MESSUNGEN VON NEUTRALTEILCHENDICHTEN UND TEMPERATUREN DER UNTEREN THERMOSPHAERE IN POLAREN BREITEN UND WINTERBEDINGUNGEN.
G. Schneppe. Sep 72, 99p BMBW-FB-W-72-29
Contract WRK-170
In German; English Summary.

Descriptors: *Neutral particles, *Polar regions, *Rocket sounding, Atmospheric composition, Atmospheric density, Atmospheric ionization, Atmospheric temperature, European space programs, Mass spectroscopy, Temperature profiles, Thermosphere, Winter.

For abstract, see STAR 1122

N73-31638/2GA PC$3.00/MF$1.45
Lockheed Missiles and Space Co., Palo Alto, Calif. Space Sciences Lab.
ANALYSIS OF LOW ENERGY ELECTRONS.
Final Report.
R. D. Sharp. 1 Jun 73, 15p LMSC-D350709, NASA-CR-133920
Contract NASW-2253

Descriptors: *Auroral zones, *Electron energy, *Plasma sheaths, Computer programs, Geophysical observatories, Mapping, Ogo-c, Spectrometers.

For abstract, see STAR 1122

N73-31658/0GA PC$6.50/MF$1.45
Max-Planck-Institut fuer Physik und Astrophysik, Munich (West Germany).
NUMERICAL MODELLING OF PLASMA CLOUDS IN THE IONOSPHERE.
K. H. Lloyd, and G. Haerendel. Jul 72, 89p MPI-PAE/EXTRATERR-73

Descriptors: *E region, *Equations of motion, *F region, *Mathematical models, *Plasma clouds, Atmospheric models, Distortion, Ionospheric drift, Numerical integration, Problem solving.

For abstract, see STAR 1122

PATENT-3 751 913/GA Not available NTIS
Temple Univ. Research Inst., Philadelphia, Pa.
BARIUM RELEASE SYSTEM.
Patent.
B. W. Lewis, C. S. Stokes, E. W. Smith, and W. J. Murphy. Patented 14 Aug 73, 5p NASA-CASE-LAR-10670-1,
Misc-Filed 31 Jul. 1970 Supersedes N70-36004 (08 - 19, p 3493). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Artificial clouds, *Barium, Exhaust gases, Geophysics, Interplanetary space, Patents, Rocket engines, Upper atmosphere, Vapor phases.

A chemical system is described for releasing a good yield of free barium neutral atoms and barium ions in the upper atmosphere and interplanetary space for the study of the geophysical properties of the medium. The barium is released in the vapor phase so that it can be ionized by solar radiation and also be excited to emit resonance radiation in the visible range. The ionized luminous cloud of barium becomes a visible indication of magnetic and electrical characteristics in space and allows determination of these properties over relatively large areas at a given time.

PB-224 900/1GA PC$6.00/MF$1.45
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
RADIATIVE EFFECTS OF CIRRUS CLOUDS.
Master's thesis,
James R. Fleming. Aug 73, 78p CSU-ATSP-207
Grant NS-GA-36302
International Standard Book no. 0067-0340.

Descriptors: (*Cirrus clouds, Atmosphiric radiation), Tropical atmospheres, Marine atmospheres, Heat budget, Theses.

The divergence of net radiation in a tropical atmosphere with cirrus clouds has been examined in terms of two bulk radiative properties of the cloud: shortwave optical thickness and broadband infrared emissivity. The net radiative energy budget of the tropical atmosphere over an ocean surface in the presence and absence of a cirrus cloud has been examined. The total net radiative energy loss of the atmosphere when a cirrus layer is present is shown to be 22% to 78% of the loss from a cloudless sky. This suppression of divergence generates in 24 hours an amount of energy which is 32% to 99% of the estimated net latent heat released to the atmosphere by precipitation processes in a cumulonimbus cloud. The divergence of net radiation through three layers encompassing the atmosphere is shown to be linearly dependent on the cirrus cloud's infrared emissivity and shortwave optical thickness. (Modified author abstract)

SC-TM-720716/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
MODELING THE CHEMICAL KINETICS OF THE STRATOSPHERE.
F. P. Hudson. Jun 73, 49p

Descriptors: (*Stratosphere, *Chemical reaction kinetics), Carbon, Earth atmosphere, Hydrogen, Lectures, Molecules, Nitrogen, Oxygen, Solar radiation.

For abstract, see NSA 28 07, number 16381.

UCRL-51385/GA PC$5.50/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.

LLL ELECTRON AND PROTON SPECTROMETER ON NASA'S ORBITING GEOPHYSICAL OBSERVATORY 5.
H. I. Jr. West, R. M. Buck, and J. R. Walton. 29 May 73, 66p
Contract W-7405-eng-48

Descriptors: (*Beta spectrometers, *Operation), (*Proton spectrometers, Operation), (*Magnetosphere, *Electrons), (*Interplanetary space, Electrons), Flat magnetic spectrometers, Ogo satellites, Protons.

For abstract, see NSA 28 07, number 16398.

4B. Meteorology

AD-768 391/5GA PC$3.00/MF$1.45
Environmental Technical Applications Center (Air Force) Washington D C
THE OCHELTREE TORNADO: A CASE STUDY.
Technical note,
William E. Finley, Charles A. Perry, and Billy W. Brown. Mar 73, 35p Rept no. USAFETAC-TN-73-2

Descriptors: (*Tornadoes, *Kansas), (*Missouri, Tornadoes), Thunderstorms, Wind, Hail, Air mass analysis, Meteorological charts, Meteorological radar, Damage, Weather forecasting.
Identifiers: Storm tracks, AN/FPS-77.

A classic example of the midwestern United States tornado occurred near Richards-Gebaur AFB, Missouri, on 1 May 1972 (GMT date) as an associated feature of a steady-state severe thunderstorm. This case study of that storm describes synoptic and mesoscale aspects of the situation using meteorological charts and diagrams and presents radar scope photographs from the Air Force Air Weather Service AN/FPS-77 Storm Detection Radar at Richards-Gebaur AFB, near Kansas City, Missouri. Included in the photographs are several highly unusual range height indicator (RHI) sections through the parent thunderstorm and tornado tube. A partial survey of damage caused by the tornado is included. Some suggestions to non-centralized weather forecasters for coping with an imminent tornadic thunderstorm are presented in the final section of the Technical Note. (Author)

AD-768 418/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
NUMERICAL INTEGRATION OF AN INERTIA MODEL OVER LONG PERIODS,
L. S. Gandin, B. M. Illin, V. P. Meleshko, and L. V. Rukhovets. 26 Sep 73, 20p Rept no. FTD-HT-23-505-73
Edited trans. of Gidrodinamicheskie Issledovaniya Tsirkulyatsii Atmosfery (USSR) n256 p108-120 1970, by Paul J. Reiff.

Descriptors: (*Atmospheric motion, Numerical analysis), Nonlinear differential equations, Partial differential equations, Integration, USSR.
Identifiers: Translations.

The solution of problems involving the numerical modeling of a climatic condition of the atmosphere by the determination method is associated with integration of a system of non-linear differential equations in partial derivatives having a large number of steps per unit time. The authors consider two situations: Experiments with a barotropic inertial model; and, Experiment using a thermotropic inertial model.

AD-768 456/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PECULARITIES OF THE VERTICAL STRUCTURE OF METEOROLOGICAL ELEMENTS IN VARIOUS LATITUDINAL ZONES,
L. S. Gandin, R. Mutalov, and L. V. Rukhovets. 12 Sep 73, 13p Rept no. FTD-HT-23-777-73
Edited trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n286 55-62 1972, by Louise E. Heenan.

Descriptors: (*Atmospheric motion, Tropical regions), Wind, Statistical analysis, USSR.
Identifiers: Translations, Seasonal variations.

AD-768 463/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE PROPERTIES OF ACTIVE CONDENSATION NUCLEI,
E. Meszaros, and A. Meszaros. 28 Sep 73, 14p Rept no. FTD-HT-23-66-74
Edited trans. of Vsesoyuznoi Konferentsii po Fizike Oblakov i Aktivnym Vozdeistviyam. Trudy (USSR) v8 p77-83 1970, by Victor Mesenzeff.

Descriptors: (*Atmospheric condensation, *Clouds), Nuclei, Aerosols, Hungary, USSR.
Identifiers: Translations, *Condensation nuclei, Cloud physics.

One of the most efficient methods for determining the number of active cloud nuclei is the determination of the concentration of cloud drops in the lower layer of recently-formed clouds. With this in mind, microstructural measurements were made in the lower layer of recently-formed summer cumulus clouds over Hungary. The concentration of large and giant aerosol particles was determined simultaneously by airplane, using plates and membrane filters. Independently of these measurements, the physical and chemical properties of an atmospheric aerosol were also studied.

AD-768 464/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SPECTRAL EXPANSION OF NONLINEAR TERMS IN EQUATIONS OF THE DYNAMICS OF THE ATMOSPHERE,
M. I. Yudin. 11 Oct 73, 17p Rept no. FTD-HT-23-90-74
Edited trans. of mono. Novye Metody i Problemy Kratkostochogo Prognoza Pogody, n.p., 1963 p367-377, by Paul J. Reiff.

Descriptors: (*Atmospheric motion, Nonlinear differential equations), Vortices, Turbulence, Integrals, Stochastic processes, Probability density functions, USSR.
Identifiers: Translations.

AD-768 501/9GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
MESOSCALE HISTORY OF A SMALL PATCH OF CLEAR AIR TURBULENCE,
Roland J. Boucher. 31 Jan 73, 8p Rept no. AFCRL-TR-73-0601
Revision of report dated 10 Jul 72.
Availability: Pub. in Jnl. of Applied Meteorology, v12 n5 p814-821 Aug 73.

Descriptors: (*Clear air turbulence, Statistical analysis), Radar echo areas, Wind, Air mass analysis, Atmospheric temperature.
Identifiers: Synoptic meteorology.

Sequential analyses of data from a network of eight special rawinsonde stations 100 km apart demonstrate the important effects of mesoscale disturbances in a 2-1/2-hr episode of light-to-moderate clear air turbulence (CAT). The most significant feature was the development of two turbulent fields below and above a 2-km region of a wind minimum which passed over Wallops Island, Va., near 1530 GMT 4 February 1970. The samll scale of these features preclude their detection in the standard 12-hr observation sequence. The rawinsonde network used here incorporating fine-scale details in both space and time is adequate to provide a very useful current CAT depiction and an excellent source for the preparation of a short range forecast of CAT. (Author)

AD-768 527/4GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
A REVISED ASSESSMENT OF RADIOSONDE ACCURACY,
Robert W. Lenhard. 1973, 3p Rept no. AFCRL-TR-73-0574
Availability: Pub. in the Bulletin of the American Meteorological Society, v54 n7 p691-693 Jul 73.

Descriptors: (*Radiosondes, Accuracy), Atmospheric sounding, Barometric pressure, Atmospheric temperature, Density, Errors.
Identifiers: AN/GMD-1.

The differences in density between paired, simultaneous, AN/GMD-1 radiosonde flights released 10 miles apart are used to determine maximum values for the random sensing errors in pressure and temperature for the system. These were 2.48 mb and OC or 0 mb and 0.240C. A rational combination of 1.5 mb and 0.2C (rms error) is used to compute tables of representative errors of height and density at specified pressure and of pressure and density at specified height. (Author)

AD-768 528/2GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
A STATISTICAL APPROACH TO EVALUATING FOG DISPERSAL OPERATIONS,
Bruce A. Kunkel. 30 Mar 73, 6p Rept no. AFCRL-TR-73-0602
Revision of report dated 14 Dec 72.
Availability: Pub. in the Jnl. of Applied Meteorology, v12 n5 p883-887 Aug 73.

Descriptors: (*Fog, Scattering), Statistical analysis, Visibility, Cost effectiveness, Landing fields.
Identifiers: *Fog dispersal, Evaluation.

A statistical approach that can be used as an aid in evaluating the results and cost effectiveness of fog modification operations is presented. This approach requires the use of climatic probabilities of natural visibility improvements to above minimum conditions. These probabilities were obtained from 10 years of WBAN records for those airfields that are prime candidates for fog modification experiments. Some examples of these conditional probabilities as a function of time are presented. Based on these probabilities one can determine the number of fog modification tests required in order to achieve a certain degree of confidence that the treatment is responsible for improving the visibility to above minimum conditions. This approach also provides a more suitable means of determining cost/benefit ratios. The application of this approach to past and future log dispersal operations is discussed. (Author)

AD-768 543/1GA Reprint
California Univ San Diego La Jolla
LINEARIZED CALCULATIONS OF URBAN HEAT ISLAND CONVECTION EFFECTS,
D. B. Olfe, and R. L. Lee. 15 Jul 71, 15p AFOSR-TR-73-1926
Contract F44620-68-C-0010
Revision of report dated 22 Feb 71.
Availability: Pub. in Jnl. of Atmospheric Sciences, v28 n8 p1374-1388 Nov 71.

Descriptors: (*Urban areas, *Convection(Atmospheric)), Atmospheric temperature, Atmospheric motion, Coriolis effect, Flow fields, Equations of motion, Mathematical models.
Identifiers: *Urban heat islands, Atmospheric diffusion, Eddies.

Steady, linearized flow calculations are carried out to estimate vertical temperature profiles over a heated area representing a city. Initially, a planar flow is considered in a stable atmosphere with a constant stability and a constant effective eddy diffusivity for heat transfer. The calculations predict the main effects observed over urban areas: (1) positive temperature perturbations near the ground which will tend to cancel the early morning radiation inversion, and (2) negative temperature perturbations aloft which will tend to produce one or more weak inversions several hundred meters above the city. Within the linearized framework the calculations are extended to include different planar surface temperature distributions, the three-dimensional case of a circular heat island, a two-layer atmosphere having a change in stability at a suitable altitude, a constant eddy viscosity for the perturbed flow, and the Coriolis force. (Modified author abstract)

AD-768 611/6GA Reprint
Hawaii Univ Honolulu Dept of Information and Computer Science
AUTOREGRESSIVE SPECTRUM ESTIMATION,
Richard H. Jones. 1973, 10p AFOSR-TR-73-1911
Grant AF-AFOSR-2405-72
Availability: Pub. in Proceedings of Conference (3rd) on Probability and Statistics in Atmospheric Science, 19-22 Jun 73, Boulder, Colo.

Descriptors: (*Meteorological phenomena, Time series analysis), (*Time series analysis, Graphics), Analysis of variance, Multivariate analysis, Transfer functions, Power spectra.
Identifiers: Spectrum analysis.

In recent years there has been increasing interest in autoregressive spectrum estimates among time series analysis researchers. This procedure fits a finite autoregression to the time series data and calculates the spectrum from the estimated autoregression coefficients and the one step prediction error variance. For multivariate time series, the estimated autoregressive matrices produce estimates of the spectra, coherences, phases, and group delay. The spectra of some meteorological time series are estimated by the autoregressive method and by classical procedures and the plots superimposed. The order of the autoregression is selected using Akaike's Selection Criterion (ASC). It is concluded that both methods plotted together produce a much stronger feeling for the shape of the true spectrum than either method alone. (Author)

AD-768 632/2GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
RADAR AND SODAR PROBING OF WAVES AND TURBULENCE IN STATICALLY STABLE CLEAR-AIR LAYERS,
Kenneth R. Hardy, Hans Ottersten, and C. Gordon Little. 8 Aug 72, 41p Rept no. AFCRL-TR-73-0583
Availability: Pub. in Boundary-Layer Meteorology, v4 p47-89 1973.

Descriptors: (*Atmospheric motion, Detection), Clear air turbulence, Wind, Atmospheric temperature, Humidity, Radar echo areas, Sound signals.
Identifiers: *Remote sensing, Gravity waves.

The paper reviews the remote sensing of waves and turbulence in statically stable atmospheric layers, using sodar and microwave radar echoes from the small-scale inhomogeneities in gaseous refractive index caused by localized fluctuations in temperature, humidity, and velocity. Scattering theory and sounding methodology are reviewed briefly, and the relative performance of typical radar and sodar systems compared. The main section of the paper takes the form of a summary and discussion of experimental progress since 1969, showing how the echo patterns obtained may be applied to the interpretation of multiple layering, gravity waves, internal fronts and the details of dynamic instability and the genesis of turbulence in stably stratified shear layers. In addition, methods for the measurement of the intensity of the small-scale variability of wind, temperature and water vapor from the observed radar or sodar echo intensities, and the use of Doppler techniques for the measurement of mean velocity and turbulence are discussed. (Author)

AD-768 644/7GA Reprint
Florida State Univ Tallahassee Dept of Oceanography
AN OBJECTIVE METHOD OF PREPARING CLOUD COVER FORECASTS,
James R. Sims. 5 Feb 73, 5p Rept no. 112
Contract N00014-67-A-0235-0002
Availability: Pub. in Jnl. of Applied Meteorology, v12 p726-728 Jun 73.

Descriptors: (*Cloud cover, *Weather forecasting), Massachusetts, Regression analysis.
Identifiers: Boston(Massachusetts).

The numerical 6-hourly output from the six-layer NMC PE model is used to predict the average daytime cloudiness in the spring for Boston. The variables chosen as predictors are the PE model predictions of the mean surface to 500-mb relative humidity, the 700-mb vertical velocity, and the relative humidity trend through a 12-hr. period. The cloud forecasts are obtained using a regression equation. The results demonstrate forecasting skill, in contrast to persistence, which is shown to be a poor predictor. (Author)

AD-768 669/4GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
HERMITE INTERPOLATION ALGORITHM FOR CONSTRUCTING REASONABLE ANALYTIC CURVES THROUGH DISCRETE DATA POINTS.
Air Force surveys in geophysics,
Paul Tsipouras, and Rene V. Cormier. 6 Jul 73, 33p Rept nos. AFCRL-AFSIG-272, AFCRL-TR-73-0400

Descriptors: (*Wind, Curve fitting), (*Interpolation, Algorithms), Graphics, Polynomials, Least squares method, Boundary layer.
Identifiers: Hermite interpolation, Lagrange interpolation, Hermite functions.

Research was conducted using winds and temperatures measured on a 1500-ft tower at a few irregularly spaced levels. The research methodology required the construction of reasonable analytic curves of wind and temperature vs height. The curves were to be capable of integration and differentiation and were to be generated and plotted by computer without human intervention. Reasonable was subjectively defined as the curve that an individual would most probably draw by hand through the same data points. Of the several techniques tried, only an algorithm consisting of Hermite interpolation between every two successive points with artificial construction of required derivatives generated reasonable curves. Derivatives are artificially constructed by a subroutine which duplicates the constraints that an individual subconsciously employs when drawing a curve through discrete data points. The report discusses the techniques investigated, graphically demonstrates the advantages and reasonableness of this algorithm, and describes it in detail. This algorithm should be applicable for fitting a continuous curve to discrete data of any sort. (Author)

AD-768 671/0GA PC$3.50/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
THERMAL AND CHEMICAL FOG DISSIPATION--RESULTS OF FIELD EXPERIMENTS AT VANDENBERG AFB, CALIFORNIA, DURING JULY 1972.
Environmental research papers,
Bruce A. Kunkel, Bernard A. Silverman, and Alan I. Weinstein. 8 Aug 73, 51p Rept nos. AFCRL-TR-73-0502, AFCRL-ERP-454

Descriptors: (*Fog, Removal), (*Runways, Visibility), Heating, Condensation reactions, Wind, Reliability, California.
Identifiers: *Fog dispersal, Vandenberg Air Force Base, Weather modification.

Results of thermal and chemical fog dispersal tests, conducted by AFCRL during July 1972, are presented and discussed. Forty-three tests were conducted in fog, thirty-three of which were suitable for analysis. Ninety-six additional heat tests were conducted in clear air. Two wide-area urea seeding tests were also performed. An instrumented 200-ft tower, a lidar, and a ground network of visibility sensors and droplet sampler were used to monitor the effects of the tests on the foggy environment. The seeding tests were unsuccessful. Improper execution of the wide-area seeding pattern due to a lack of knowledge of the winds at the seeding location was responsible for the failure of the seeding tests. (Modified author abstract)

AD-768 672/8GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
AN ASSESSMENT OF THE CARBON HUMIDITY ELEMENT IN RADIOSONDE SYSTEMS.
Instrumentation papers,
Frederick J. Brousaides. 18 Jul 73, 46p Rept nos. AFCRL-IP-197, AFCRL-TR-73-0423

Descriptors: (*Humidity, Measurement), (*Radiosondes, Reliability), Hygrometers, Carbon, Design, Accuracy.
Identifiers: Instrument characteristics, Error analysis.

Recent studies have indicated that serious errors exist in the measurement of relative humidity as obtained by U.S. radiosondes. This disclosure has caused some concern in the meteorological community as to the overall accuracy and reliability of carbon humidity element measurements. The intent of this report is to enumerate in a general fashion the problems involved with humidity sensing from radiosondes and with the errors that are inherent in this immersion-type sensor. An assessment of the carbon humidity element is outlined for various parameters. Included are the results of selected field and laboratory sensor studies performed over the past several years by AFCRL. (Author)

AD-768 678/5GA PC$4.50/MF$1.45
Battelle Columbus Labs Ohio
CLIMATOLOGICAL AND ENVIRONMENTAL FACTORS THAT INFLUENCE SURVIVAL ON THE GREAT LAKES.
Interim rept. 28 Nov 72-15 Jan 73,
J. V. Baum, J. M. Tierney, and P. R. Sticksel. 15 Jun 73, 36p USCG--11-74
Contract DOT-CG-23223-A

Descriptors: (*Great lakes, *Survival), (*Climatology, Great lakes), Casualties, Merchant vessels, Lake waves, Weather, Wind, Atmospheric precipitation, Ice, Visibility.

The report presents a summary of weather and associated Great Lakes environmental conditions that are pertinent to survival. Selected average and extreme weather data are presented according to Lake regions. Some additional data are included on notable weather conditions and weather related casualties. (Author)

AD-768 703/1GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
MICROSTRUCTURE OF FOG IN KIEV,
L. Z. Prokh. 8 Aug 73, 11p Rept no. FSTC-HT-23-1230-72

Trans. of mono. Issledovaniya Protsessov Oblako-Osadkoobrazovaniya, Leningrad, 1968 p136-143.

Descriptors: (*Fog, Particle size), Measurement, Statistical distributions, Microphotography, USSR.
Identifiers: Translations, Kiev(USSR).

Results are presented of frequent measurements of Kiev fog drop sizes. Measurements were performed with the aid of a slit trap during free precipitation of the fog drops upon horizontal surfaces.

AD-768 717/1GA PC$3.00/MF$1.45
Weather Wing (3rd) Offutt AFB Nebr
THERMAL PARAMETERS AS PREDICTORS OF PRECIPITATION TYPE FOR GRAND FORKS AFB, NORTH DAKOTA.
Aerospace sciences technical note,
Russell W. Reed. 1 Oct 73, 20p Rept no. 3WW-TN-73-4

Descriptors: (*Weather forecasting, Atmospheric precipitation), Military facilities, North Dakota, Correlation techniques, Thermal analysis, Atmospheric temperature.
Identifiers: Grand Forks Air Force Base.

Eight individual thermal parameters and five sets of two parameters from Bismarck, ND, radiosonde data tapes are correlated with the type of precipitation that occurred at Grand Forks AFB, ND, within three hours of radiosonde time. Thermal parameters tested are 1000-850 mb, 1000-700 mb, 1000-500 mb, and 850-700 mb thickness, and surface, 950 mb, 850 mb, and 700 mb temperature. The period of record is May 1959 to August 1964. (Author)

AD-768 733/8GA PC$5.00/MF$1.45
National Climatic Center Asheville N C
NORTH INDIAN TROPICAL CYCLONE VECTOR MEAN CHARTS,
Harold L. Crutcher, and Murray L. Nicodemus. Oct 73, 57p
Sponsored by Naval Weather Service Command, Washington, D.C.

Descriptors: (*Tropical cyclones, *Indian Ocean), Meteorological charts, Map projection, Weather forecasting, Hurricane tracking.
Identifiers: Bengal Bay, *Arabian Sea.

The paper presents resultant directions and distances for tropical cyclone movements in the North Indian Ocean, Bay of Bengal, and Arabian Sea. Charts present the movements for separate five-degree latitude-longitude areas, for five seasons and for six time intervals. In addition, the charts provide sufficient information to allow the user to construct 0.90 probability ellipses. (Author)

AD-768 749/4GA PC$3.00/MF$1.45
Navy Weather Research Facility Norfolk Va
GLOBAL VIEW OF THE ORIGIN OF TROPICAL DISTURBANCES AND STORMS.
Technical paper,
William M. Gray. Mar 68, 16p
Contract NAVWEARSCHFAC-TP-2-68

Descriptors: (*Storms, Tropical regions), Troposphere, Heating, Wind, Vortices, Statistical analysis, Pacific Ocean, Indian Ocean, West Indies, Marine meteorology.
Identifiers: Synoptic meteorology.

The basic report is a progressive step in an updating of tropical storm climatology. It discusses areas which subsequently became tropical geographic areas: the northwest Pacific Ocean, the Indian Ocean and the West Indies. Mean motion fields were computed with respect to a coordinate system with its origin at the moving potential storm center.

AD-768 750/2GA PC$3.75/MF$1.45
Navy Weather Research Facility Norfolk Va
STRUCTURE OF A STEADY-STATE COLD LOW. THE TROPICAL UPPER-TROPOSPHERIC TROUGH AS A SECONDARY SOURCE OF TYPHOONS AND A PRIMARY SOURCE OF TRADEWIND DISTURBANCES,
Technical paper,
Toby N. Carlson, and James C. Sadler. Jun 68, 32p Rept no. NAVWEARSCHFAC-TP-15-68
Prepared in cooperation with National Hurricane Research Lab., Miami, Fla. and Hawaii Univ., Honolulu.

Descriptors: (*Air mass analysis, Tropical regions), Troposphere, Tropical cyclones, Atmospheric motion.
Identifiers: ECCRO project.

The report contains review-condensations of two papers on the subject of 'cold-core' Lows in the Tropics. The first paper describes the characteristic distribution of atmospheric parameters and weather conditions relative to a moving tropical 'cold Low' system. This detailed diagnosis covers the six-day period 12-18 October 1965, during which an unusually dense data base was provided through Project ECCRO plus TIROS V-X satellite pictures and specially arranged supplementary radiosonde observations. The paper discusses the relationship between cold Lows and the upper-tropospheric trough as a causal factor.

AD-768 757/7GA PC$3.50/MF$1.45
Navy Weather Research Facility Norfolk Va
SURFACE WINDS OVER THE SOUTH CHINA SEA DURING THE NORTHEAST MONSOON SEASON.
Technical paper,
Herbert Riehl. Sep 68, 28p Rept no. NAVWEARSCHFAC-TP-22-68

Descriptors: (*Wind, *South China Sea), Velocity, Numerical analysis, Laminar flow, Periodic variations, Regression analysis, Naval operations, Tonkin Gulf, Weather forecasting.
Identifiers: Monsoons, Eddies, Wind velocity.

Meteorological services in support of South China Sea naval operations during the Northeast Monsoon season may conveniently be divided into three parts, insofar as the surface wind field is concerned: (1) Specification of the current wind field, especially of wind speed; (2) prediction of monsoon 'surges'; and (3) special computations regarding the 'Gulf of Tonkin Eddy.' These three topics are discussed in the report.

AD-768 758/5GA PC$3.50/MF$1.45
Navy Weather Research Facility Norfolk Va
A COMPARISON OF JANUARY-FEBRUARY 1968 CLOUD COVER AND WEATHER CONDITIONS IN THE TONKIN GULF--NORTERN VIETNAM REGION.
Technical paper,
Samson Brand, and Joseph Bocchieri. Dec 68, 28p Rept no. NAVWEARSCHFAC-TP-32-68

Descriptors: (*Cloud cover, *Tonkin Gulf), (*Meteorological parameters, *Vietnam), Visibility, Ceiling, Periodic variations, Wind, Meteorological charts, Meteorological satellites, Atmospheric temperature, Brightness, Time series analysis.
Identifiers: ESSA 3 satellite, ESSA 5 satellite, Synoptic meteorology, Monsoons, North Vietnam.

The purpose of this study is to compare the cloud cover and weather over Tonkin Gulf and Vietnam north of 15 degrees N. during two months of the Northeast Monsoon, January and February 1968, which exhibited markedly different synoptic regimes. An attempt is made to relate the observed cloud and weather patterns to the synoptic circulation patterns during each of these two months.

AD-768 759/3GA PC$4.00/MF$1.45
Navy Weather Research Facility Norfolk Va
SHORT-RANGE PREDICTION OF THE AVERAGE SURFACE WIND SPEED OVER THE SOUTH CHINA SEA DURING THE NORTHEAST MONSOON SEASON.
Technical paper,
Joseph R. Bocchieri. Jun 69, 39p Rept no. NAVWEARSCHFAC-TP-12-69

Descriptors: (*Wind, *South China Sea), Velocity, Periodic variations, Regression analysis, Correlation techniques, Atmospheric temperature, Barometric pressure.
Identifiers: *Wind velocity, Monsoons, Synoptic meteorology.

Using five years of winter-season data, empirical equations are developed to provide 24-, 30-, and 48-hour forecasts of the average surface wind speed in the northern part of the South China Sea during the Northeast Monsoon season. The sea-level pressure over subtropical China and persistence are found to be suitable predictors. The equations are simple and convenient to use, exhibit some skill over persistence, and should be operationally useful. They should be especially helpful during the period subsequent to a surge in the Northeast Monsoon. (Author)

AD-768 760/1GA PC$3.75/MF$1.45
Navy Weather Research Facility Norfolk Va
WIND CONDITIONS IN THE CUA VIET RIVER AREA DURING THE SOUTHWEST MONSOON.
Technical paper,
Samson Brand, and Arthur J. Lester. Jul 69, 35p Rept no. NAVWEARSCHFAC-TP-15-69

Descriptors: (*Weather forecasting, Wind), (*Wind, *Vietnam), Intensity, Rivers, Diurnal variations, Troposphere, Numerical analysis, Thailand, Laos.
Identifiers: Cua Viet River, South Vietnam, Monsoons, *Wind velocity.

Surface wind conditions in the Cua Viet River area are examined to determine the nature of the strong, southwesterly, Winds-of-Laos situations which occur during the Southwest Monsoon. A preliminary indicator of not only the intensity and areal coverage of these strong winds, but also their diurnal variability, is found in the 850-mb. and 2,000-ft. flow over eastern Thailand. (Author)

AD-768 761/9GA PC$4.50/MF$1.45
Navy Weather Research Facility Norfolk Va
TROPICAL CYCLONE EVASION PLANNING.
Technical paper,
W. L. Somervell, Jr., and J. D. Jarrell. May 70, 48p Rept no. NAVWEARSCHFAC-TP-16-69(Rev)

Descriptors: (*Tropical cyclones, Weather forecasting), Warning systems, Evasion, Marine meteorology.
Identifiers: Storm tracks, Hurricanes, Typhoons.

Heavy weather doctrine within both the Atlantic and Pacific Fleets has long prescribed evasion as the foremost precautionary action to be considered when a ship is threatened by a hurricane or typhoon. The paper reviews a number of factors pertinent to evasion planning. It is written with respect to tropical cyclones of the Northern Hemisphere, but the corresponding Southern Hemispheric interpretation may easily be deduced. Moverover, characteristic features of Northern Hemisphere tropical cyclones in the Pacific Ocean are virtually the same as those of the Atlantic and Indian Oceans. Therefore, the rationale presented and the tactics suggested herein apply equally well to all oceans.

AD-768 836/9GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab

14801 LANCE, MISSILE NOS. 2207/2190, ROUND NOS. 197 APT/198 APT (4 OCTOBER 1973).
Meteorological data rept.
Oct 73, 41p Rept no. DR-792

Descriptors: (*Meteorological parameters, *Upper atmosphere), (*Sounding rockets, Impact prediction), Guided missile ranges, Exterior ballistics, Rocket trajectories, Atmospheric temperature, Barometric pressure, Wind, Humidity, Density, Refractive index, Tables, New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 14801 Lance, Missile Numbers 2207/2190, Round Numbers 197 APT/198 APT, are presented in tabular form. (Author)

AD-768 837/7GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
14801 LANCE, MISSILE NO. 2204, ROUND NO. 202 APT (18 OCTOBER 1973).
Meteorological data rept.
Oct 73, 37p Rept no. DR-797

Descriptors: (*Meteorological parameters, *Upper atmosphere), (*Sounding rockets, Impact prediction), Guided missile ranges, Exterior ballistics, Rocket trajectories, Atmospheric temperature, Barometric pressure, Wind, Humidity, Density, Refractive index, Tables, New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 14801 Lance, Missile Number 2204, Round Number 202 APT, are presented in tabular form. (Author)

AD-768 838/5GA PC$3.00/MF$1.45
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
14801 LANCE, MISSILE NO. 2192, ROUND NO. 201 APT (18 OCTOBER 1973).
Meteorological data rept.
Oct 73, 36p Rept no. DR-796

Descriptors: (*Meteorological parameters, *Upper atmosphere), (*Sounding rockets, Impact prediction), Guided missile ranges, Exterior ballistics, Rocket trajectories, Atmospheric temperature, Barometric pressure, Wind, Humidity, Density, Refractive index, Tables, New Mexico.
Identifiers: Lance missiles, Missile modification.

Meteorological data gathered for the launching of 14801 Lance, Missile Number 2192, Round Number 201 APT, are presented in tabular form. (Author)

AD-768 920/1GA MF$1.45
Freie Universitaet Berlin (West Germany) Institut Fuer Meteorologie Und Geophysik
METEOROLOGISCHE ABHANDLUNGEN BAND 83 HEFT 4. DAILY AND MONTHLY NORTHERN HEMISPHERE 5-MILLIBAR-SYNOPTIC WEATHER MAPS OF THE YEAR 1968, JULY-SEPTEMBER.
Final technical rept.,
Karin Labitzke. 1973, 131p
Contract DAJA37-71-C-0993
See also report dated 1973, AD-759 965.
Availability: Paper copy available from the Institute for Meteorology and Geophysics of the Free University of Berlin, Germany.

Descriptors: (*Meteorological charts, *Northern Hemisphere), Stratosphere, Atmospheric sounding, Radiosondes, Statistical data, Atmospheric temperature, Atmospheric motion, Barometric pressure, Diurnal variations, West Germany.
Identifiers: Synoptic meteorology, Atmospheric circulation.

The report contains a series of stratospheric weather maps for the 5-mb-level. Included are daily height and temperature analyses for three months for the northern hemisphere based on radiosonde and rocketsonde measurements and performed by using a hydrostatic build-up method. The corresponding monthly mean maps and their variations are included as well as the mean grid point data calculated from the daily values. The circulation pattern during the period under consideration is described with special emphasis on the processes at high latitudes. (Author)

AD-768 970/6GA PC$3.00/MF$1.45
Weather Science Inc Norman Okla
STUDIES OF THE RAIN PARAMETERS OF RANDOMLY SEEDED WARM AND COLD CUMULI.
Final rept. 11 May 70-1 Jul 73,
Joe L. Sutherland, and D. Ray Booker. 1 Jul 73,
40p Rept no. WR302 AFCRL-TR-73-0515
Contract F19628-70-C-0228
See also report dated 15 Jun 72, AD-750 889.

Descriptors: (*Cumulus clouds, *Artificial precipitation), Raindrops, Silver compounds, Iodides, Urea, Encapsulation, Spectrometers, Numerical analysis, Experimental data, New Mexico, Florida, Oklahoma.
Identifiers: *Cloud seeding.

Two hygroscopic seeding experiments on warm cumuli off the Florida coast and in Oklahoma have yielded the following results. The maritime Florida clouds are modified by encapsulated urea seeding in that the initial surge of large raindrops at the beginning of the non-seeded showers is displaced toward the middle of the life of the seeded showers. Also the slope of the raindrop spectra of the seeded Florida clouds is less steep, implying more large drops, and fewer small drops. Even though the raindrop spectra are significantly different, the difference is not large enough to cause a significant difference in the radar reflectivity-rainfall rate relationship. The continental warm cumuli in Oklahoma were not apparently affected by the hygroscopic seeding. However, the seeding amount was appreciably smaller. Calibration testing of the RR40 Raindrop Spectrometer has resulted in an empirical calibration equation that is considerably different from the original calibration equation that was derived from impulse theory. (Author)

AD-768 975/5GA Reprint
Scripps Institution of Oceanography La Jolla Calif
BIRTH OF HURRICANE AGNES-TRIGGERED BY THE TRANSEQUATORIAL MOVEMENT OF A MESOSCALE SYSTEM INTO A FAVORABLE LARGE-SCALE ENVIRONMENT,
Jerome Namias. 8 Nov 72, 5p
Contract N00014-66-C-0241
Revision of report dated 21 Aug 72.
Availability: Pub. in the Monthly Weather Review, v101 n2 p177-179 Feb 73.

Descriptors: (*Tropical cyclones, Sources), Air mass analysis, Meteorological parameters.
Identifiers: Hurricane Agnes.

It is the purpose of this note to suggest that the development of the devastating storm Agnes in the second 10 days of June 1972 may have resulted from a combination of events involving an antecedent massive cold air outbreak into the Tropics and, perhaps crucially, the migration of a 'nucleating' cloud cluster of intense convective cells from the Southern Hemisphere Tropics into the Northern hemisphere.

AD-769 092/8GA PC$4.00/MF$1.45
Navy Weather Research Facility Norfolk Va
THE EFFECTS ON A TROPICAL CYCLONE OF COOLER SURFACE WATERS DUE TO UPWELLING AND MIXING PRODUCED BY A PRIOR TROPICAL CYCLONE.
Technical paper,
Samson Brand. Dec 70, 36p Rept no. NAVWEARSCHFAC-TP-16-70

Descriptors: (*Tropical cyclones, Surface temperatures), Ocean currents, Weather forecasting, Marine meteorology.
Identifiers: Upwelling, *Ocean surface, *Air water interactions.

An attempt was made to further document the mounting evidence concerning the interacting role of the ocean environment and tropical cyclones. It is shown that both the movement and the intensity of a tropical cyclone may be affected by the cooler water left in the wake of a prior storm.

COM-73-11362-01/GA PC$3.75
National Oceanic and Atmospheric Administration, Silver Spring, Md. Environmental Data Service.
ENVIRONMENTAL SATELLITE IMAGERY. JANUARY 73.
Jul 73, 97p KMRD-5.4-Jan NOAA-73090502
Key to Meteorological Records Documentation.

Descriptors: (*Cloud cover, Spaceborne photography), Photographs, Meteorological satellites, Radiometry, Remote sensing.
Identifiers: NOAA 2 satellite.

The Key to Meteorological Records Documentation (KMRD) No. 5.4 series is issued monthly to describe current cloud data obtained by NOAA's operational environmental satellites. It contains daily global satellite imagery in condensed form as a guide to data stored in the NOAA archive, and is designed to assist users in selecting data for research and climatological use. The monthly issues usually are printed and distributed within one month after the close of the month of observation. This issue provides the documentation for January 1973.

COM-73-11362-06/GA PC$3.75
National Oceanic and Atmospheric Administration, Silver Spring, Md. Environmental Data Service.
ENVIRONMENTAL SATELLITE IMAGERY.
Rept. for Jun 73.
Jul 73, 95p KMRD-5.4-Jun
Key to Meteorological Records Documentation.

Descriptors: (*Cloud cover, Spaceborne photography), Photographs, Meteorological satellites, Radiometry, Remote sensing.
Identifiers: NOAA 2 satellite.

The Key to Meteorological Records Documentation (KMRD) No. 5.4 series is issued monthly to describe current cloud data obtained by NOAA's operational environmental satellites. It contains daily global satellite imagery in condensed form as a guide to data stored in the NOAA archive, and is designed to assist users in selecting data for research and climatological use. This issue provides the documentation for June 1973.

COM-73-11362-07/GA PC$3.75
National Oceanic and Atmospheric Administration, Silver Spring, Md. Environmental Data Service.
ENVIRONMENTAL SATELLITE IMAGERY. JULY 1973.
Aug 73, 97p KMRD-5.4-Jul NOAA-73092801
Key to Meteorological Records Documentation.

Descriptors: (*Cloud cover, Spaceborne photography), Photographs, Meteorological satellites, Radiometry, Remote sensing.
Identifiers: NOAA 2 satellite.

The Key to Meteorological Records Documentation (KMRD) No. 5.4 series is issued monthly to describe current cloud data obtained by NOAA's operational environmental satellites. It contains daily global satellite imagery in condensed form as a guide to data stored in the NOAA archive, and is

designed to assist users in selecting data for research and climatological use. The monthly issues usually are printed and distributed within one month after the close of the month of observation. This issue provides the documentation for July 1973.

COM-73-11753/3GA PC$3.00/MF$1.45
National Weather Service, Kansas City, Mo. Central Region.
COLD AIR FUNNEL CLOUDS.
Technical memo.,
Jack R. Cooley, and Marshall E. Soderberg. Sep 73, 34p NOAA-TM-NWS-CR-52 NOAA-73100901

Descriptors: (*Tornadoes, Cold fronts), Clouds, Atmospheric circulation, Vortices, Meteorological data.

The occurrence of funnel clouds in warm moist air masses have been studied intensively and documented in considerable detail. Funnel cloud occurrences in cold air masses have received very little attention. The paper defines cold air funnel clouds and verifies their existence. Several cases are analyzed in detail and a tentative climatology is given. Instances of such funnels reaching the earth's surface are rare and brief with damage very minor and limited in area. Some thoughts are offered concerning the dynamic processes leading to the formation of cold air funnels. Sample statements for public release are also included. (Author)

COM-73-11760/8GA PC$3.00/MF$1.45
National Weather Service, Columbia, MO.
RAINFALL FREQUENCY ATLAS FOR MISSOURI,
Warren M. Wisner. 1973, 16p NOAA-73092716
Also pub. as Missouri Univ., Columbia. Cooperative Extension Service. Rept. No. MP-336-1973/1.5M.

Descriptors: (*Rainfall, *Missouri), Volume, Meteorological data, Seasonal variations, Meteorological charts, Atlases.

An analysis of precipitation records for Missouri provides information on how often extremely large amounts of rainfall can be expected. Rainfall amounts expected only once in a specified period of years are given. Estimates of the frequency of heavy rainfall have been determined by using 50 years of daily precipitation data from 29 stations in or near Missouri. For each year, the greatest amount of precipitation in one, two, four, seven and ten-day periods was determined. Then, through the statistical analysis given in an appendix, the values shown on the included maps were derived. A series of maps show the actual value computed for each station and the pattern for equal expected values. Seasonal variations are also shown on maps. Finally, the second appendix provides guides for estimating return periods or durations not presented on the maps.

COM-73-11771/5GA PC$3.00/MF$1.45
Chicago Univ., Ill. Dept. of the Geophysical Sciences.
PROPOSED MECHANISM OF SUCTION SPOTS ACCOMPANIED BY TORNADOES.
Research paper,
T. Theodore Fujita. 1973, 18p RP-102
Grant NOAA-E-22-93-71(G)
Report on Satellite and Mesometeorology Research Project.

Descriptors: (*Tornadoes, Vacuum), Vortices, Wind velocity, Rotation, Dust storms, Photographs, Damage.
Identifiers: Dust devils.

The report discusses proposed mechanisms of the formation of suction spots which accompany tornadoes. Following a summary of studies made on marks left by various tornadoes, the author presents an analysis of a giant dust devil and examines the life cycle of suction vortices, and a model of a tornado with multiple suction vortices, as well as the structure of suction vortices.

COM-73-11806/9GA Reprint
National Weather Service, Lakeland, Fla. Office for State Climatology.
SNOW IN FLORIDA,
James T. Bradley. 1973, 3p NOAA-73092512
Report on Noteworthy Facts About 'White Rain' in the Sunshine State Since 1774.
Pub. in Weatherwise, p72-73 Apr 73.

Descriptors: (*Snow, *Florida), Meteorological data, History.

Records of snow in Florida date back to a strange 'white rain' reported by inhabitants in 1774. Flurries can be expected about once a year, measurable amounts twice a decade and a major snow storm once every 50 years. The southern limit of measurable snow seems to be a line through Tampa, Orlando and Daytona Beach. The Fort Myers-Lake Okeechobee--Fort Pierce line is as far south as even a flake is likely to be seen. The earliest data of measurable snow is 28 November (1912) at Mt. Pleasant; the latest, 28 March (1955) at Marianna. Record amounts (in the northern counties) range from three to eight inches. (Author)

COM-73-11815/0GA Reprint
National Severe Storms Lab., Norman, Okla.
DOPPLER RADAR WITH POLARIZATION DIVERSITY,
R. J. Doviak, and D. Sirmans. 22 Sep 72, 3p NOAA-73100411
Pub. in Jnl. of Atmospheric Sciences, v30 n4 p737-738 May 73.

Descriptors: (*Meteorological radar, *Pulse doppler radar), Polarization(Waves).

A technique is proposed to uncouple the tie between unambiguous Doppler velocity and range. Transmission of orthogonally polarized waves in pairs of pulses increases a weather Doppler radar's capability to unambiguously resolve velocity spectrum mean and variance at simultaneous range locations sampled in real time. The suggested use of orthogonally polarized fields for a pulse-pair Doppler radar provides the possibility of increasing the velocity capability of a Doppler radar while reducing range ambiguities. Although a complete analysis has not been performed, the technique appears sufficiently promising to merit further study. Target polarization coupling measurements should be made at various wavelengths and particularly at longer ones, since isolation between polarizations should be largest and range-folding effects minimal. In addition, the correlation between the crossed polarized waves should be determined. (Modified author abstract)

COM-73-11816/8GA Reprint
National Severe Storms Lab., Norman Okla.
PULSED-DOPPLER VELOCITY ISOTACH DISPLAYS OF STORM WINDS IN REAL TIME,
D. Sirmans, and R. J. Doviak. 9 Mar 73, 5p NOAA-73100412
Contract DOT-FA72WA-1265
Revision of report dated 24 Jan 73.
Pub. in Jnl. of Applied Meterology, v12 n4 p694-697 Jun 73.

Descriptors: (*Meteorological radar, *Plan position indicators), (*Storms, Radar tracking), Pulse doppler radar, Real time operations, Display devices, Wind(Meterology), Precipitation(Meterology), Velocity.

First results derived from an NSSL effort to develop a real-time Plan Position Indicator (PPI) display of Doppler isotachs are described. The mean Doppler velocity is estimated for multiple range locations by measuring the phase change of the complex echo envelope over time intervals equal to the pulse repetition period. This technique, phase change per pulse pair, provides velocity estimates directly from samples of the Doppler time record to circumvent spectrum computation. (Author)

COM-73-11817/6GA Reprint
National Severe Storms Lab., Norman, Okla.
TWIN TORNADO CYCLONES WITHIN A SEVERE THUNDERSTORM: SINGLE DOPPLER RADAR OBSERVATIONS,
Rodger A. Brown, Donald W. Burgess, and Kenneth C. Crawford. 1973, 8p NOAA-73100413
Pub. in Weatherwise, v26 n2 p63-69, 71 Apr 73.

Descriptors: (*Tornadoes, Radar tracking), Pulse doppler radar, Meteorological radar, Cyclones, Weather observations, Oklahoma, Nevada.
Identifiers: *Tornado cyclones.

The paper discusses some of the preliminary findings from pulsed Doppler radar measurements made in tornado cyclones. Data are presented for the midlevels of the storm, where the Doppler velocity signatures of the two tornado cyclones are especially pronounced. A brief history of the 19 April 1972 storm in Nevada is presented. Analysis of the Doppler velocity data has led to the discovery that two tornado cyclones were present at midlevels of the storm--at a time when two tornadoes were on the ground; and that the tornado cyclone is not linked to the region near cloud base, but that its Doppler velocity pattern, or signature, can be detected to a height of about 10 km or nearly 2/3 of the distance from the ground to storm top.

COM-73-11818/4GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Wave Propagation Lab.
EFFECT OF WIND SHEAR ON ATMOSPHERIC WAVE INSTABILITIES REVEALED BY FM/CW RADAR OBSERVATIONS,
E. E. Gossard, J. H. Richter, and D. R. Jensen. 8 Aug 72, 20p NOAA-73100414
Pub. in Boundary-Layer Meterology, v4 p113-131 1973.

Descriptors: (*Wind shear, Radar echo areas), Atmospheric cirulation, Frenquency modulation, Continuous wave radar, Partial differential equations.

An FM/CW radar sounding system reveals atmospheric wave structure in unparalleled detail. The most outstanding features evident in the record are; internal gravity waves; features resembling Kelvin/Helmholtz instability structures; and multiple layering, often with lamina only a few meters thick. The paper shows a variety of atmospheric structural patterns and compares them with several hypothetical models of internal waves to obtain more insight into the atmospheric processes at work. Special attention is given to the distribution of the Richardson number in trapped and untrapped gravity waves. It is proposed that the multiple layers result from untrapped internal gravity waves whose propagation vector is directed nearly vertically within very stable height regions. It is argued that the layers are caused by dynamic instability resulting from reduction in the Richardson number due to wave induced shear and to some background wind shear when the amplitude-to-wavelength ratio grows during propagation into thermally stable regions of the atmosphere. (Modified author abstract)

COM-73-11819/2GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Atmospheric Administration, Boulder, Colo. Atmospheric Physics and Chemistry.
ATMOSPHERIC AEROSOLS: RESIDENCE TIMES, RETAINMENT FACTOR AND CLI-

MATIC EFFECTS. (ATMOSPHARICHE AEROSOLE: VERWEILZEIT, RETAINMENT FAKTOR UND KLIMATISCHE EFFEKTE),
H. K. Weickmann, and R. F. Pueschel. 4 Jan 73, 9p NOAA-73100415
Summary in German and French.
Pub. in Beitrage zur Physik der Atmosphare, v46 Band 1973, S. 112-118.

Descriptors: (*Atmospheric composition, Aerosols), Air pollution, Weather modification, Climatic changes.

A retainment factor for atmospheric aerosols has been defined as the fraction of the annually produced aerosol mass which is retained by the atmosphere. Its application to various aerosol systems leads to the following conclusions: (1) A range for R between 10 to the minus 5th power and one (average value 0.001 exists. Consequently, different aerosol systems affect climate to different degrees depending on their physical-chemical properties and their injection level within the atmosphere. (2) 11.5% of the total aerosol burden are anthropogenic. (3) From a combination of annual production rates, retainment factors and a climatic model proposed by Barrett it follows that man is responsible for a global temperature change of about 0.1C below that for a clear atmosphere. (4) From presently existing energy requirements it is estimated that in about 23 years man will be compatible with nature in aerosol production. By improved emission control techniques, however, it should be possible to control aerosol production and to avoid man-made global climatic consequences. (Modified author abstract)

COM-73-11830/9GA PC$4.00/MF$1.45
National Weather Service, Clemson, S.C.
FREQUENCY DISTRIBUTION OF MAXIMUM AND MINIMUM TEMPERATURES IN SOUTH CAROLINA,
Alex J. Kish. Sep 73, 37p NOAA-73100109
Also pub. as South Carolina Agricultural Experiment Station, Clemson. Agricultural Weather Research Ser-38.

Descriptors: (*Atmospheric temperature, *South Carolina), Seasonal variations, Tables(Data), Agriculture.

The population in the study are daily maximum and minimum temperatures presented as percentage of occurrences by weeks by classes. Unequal class intervals are used here to show certain base temperatures critical for plant growth and development. In the maximum temperature tables, temperatures from 49 to 99 degrees have equal class intervals of five degrees Farenheit each. In the minimum temperature tables, temperatures from 40 to 79 degrees have equal class intervals of five degrees Farenheit each. Temperatures critical to agriculture are minimum temperatures of less than 40F., or 32F., 28F., 24F., and 16F. and lower. A table lists the localities, its latitude and longitude, elevation and the number of years of temperature records used in this study. The source of data was from South Carolina Climatological Data, U.S. Department of Commerce.

COM-73-11833/3GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Environmental Research Labs.
RADAR AND SODAR PROBING OF WAVES AND TURBULANCE IN STATICALLY STABLE CLEAR-AIR LAYERS,
Hans Ottersten, Kenneth R. Hardy, and C. Gordon Little. 8 Aug 72, 44p NOAA-73100407
Prepared in cooperation with Air Force Cambridge Research Labs., Bedford, Mass. and Research Inst. of National Defence, Stockholm(Sweden).
Pub. in Boundary Layer Meteorology, v4 p47-89 1973.

Descriptors: (*Atmospheric motion, Remote sensing), Clear air turbulence, Fronts(Meteorology), Gravity waves, Radar echoes, Acoustic detection.
Identifiers: Sound detection and ranging.

The paper reviews the remote sensing of waves and turbulence in statically stable atmospheric layers, using sodar and microwave radar echoes from the small-scale inhomegeneities in gaseous refractive index caused by localized fluctuations in temperature, humidity, and velocity. Scattering theory and sounding methodology are reviewed briefly, and the relative performance of typical radar and sodar systems compared. The main section of the paper takes the form of a summary and discussion of experimental progress since 1969, showing how the echo patterns obtained may be applied to the interpretation of multiple layering, gravity waves, internal fronts and the details of synamic instability and the genesis of turbulence in stably stratified shear layers. In addition, methods for the measurement of the intensity of the small-scale variability of wind, temperature and water vapor from the observed radar or sodar echo intensities, and the use of Doppler techniques for the measurement of mean velocity and turbulence are discussed. (Author)

COM-73-11843/2GA PC$3.00/MF$1.45
Chicago Univ., Ill. Satellite and Mesometeorology Research Project.
JOLIET TORNADO OF APRIL 6, 1972.
Research paper,
Edward W. Pearl. Jun 73, 19p SMRP-RP-112 NOAA-73092517
Grant NOAA-E22-93-71(G)

Descriptors: (*Tornadoes, Illinois), Cyclones, Atmospheric temperature, Temperature inversions, Aerial surveys, Meteorological radar.
Identifiers: Joliet(Illinois).

On April 6, 1972 a large tornado cyclone swept through Joliet, Illinois and the surrounding area to the west. The path was 33 miles long and averaged an exceptional 3-1/2 miles wide but within the Joliet damage area there were four smaller, stronger swaths. The meteorological sequence of events leading up to the storm are examined. The analysis includes a series of surface charts, the radar investigation, and a potential temperature cross-section as well as a thorough ground and aerial survey of the damage. A shallow layer of cold polar air existed, creating an inversion over the area where the tornadoes occurred. The rare nature of the storm was such that it was difficult to call it a tornado, several tornadoes, or no tornado at all. (Modified author abstract)

COM-73-11850/7GA Reprint
National Environmental Satellite Service, Washington, D.C.
ARTIFICIAL STEREO: A TECHNIQUE FOR COMBINING MULTI-CHANNEL SATELLITE IMAGE DATA,
W. Pichel, C. L. Bristor, and R. Brower. 1973, 5p NOAA-73100107
Pub. in Bull. of the American Meteorological Society, v54 n7 p688-691 Jul 73.

Descriptors: (*Meteorological satellites, *Automatic picture transmission), Stereophotography, Infrared photography, Spaceborne photography.

The note provides a description of an artificial stereo technique which uses the thermal channel response as a spatial modulation signal to produce a stereo pair from the visual channel image. Figures are presented as illustrations. On a line-by-line basis, the IR data are utilized as pseudoheight indicators. The thermal range shown in the first figure is converted into 32 levels, with the warmest designated the surface level. A simple computer algorithm treats coincident scan lines of visual channel data and the equivalent IR data that have been transformed into a scan profile of height levels. The output is a visual channel stereo line pair in which the visual data are displayed with no change in position for elements at zero height level, but in which elements at other levels are shifted in position (shown in the second figure). Viewing the stereo pair with a stereoscope shows a scene that contains enhanced vertical structure with colder clouds appearing at higher levels. (Author)

COM-73-11856/4GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Wave Propagation Lab.
ACOUSTIC ECHO-SOUNDING TECHNIQUES AND THEIR APPLICATION TO GRAVITY-WAVE, TURBULENCE, AND STABILITY STUDIES,
D. W. Beran, W. H. Hooke, and S. F. Clifford. 8 Aug 72, 22p NOAA-73100408
Pub. in Boundary-Layer Meteorology, v4 p133-153 1973.

Descriptors: (*Atmospheric motion, Echo sounding), Gravity waves, Wind(Meteorology), Turbulence, Boundary layer, Doppler systems.
Identifiers: *Atmospheric echo sounding, Planetary boundary layer.

The paper contains a brief summary of recent experimental studies conducted by the WPL staff in order to: (a) compare acoustic echo strengths with those predicted from measured turbulence intensities and scatter theory; (b) develop optimum experimental geometries for Doppler work, and (c) use the acoustic echo-sounder as a quantitative tool in studies of gravity wave dynamics in, and immediately above, the stable planetary boundary layer. (Modified author abstract)

N73-30434/7GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EVALUATION OF A DEVICE FOR IN-FLIGHT DETERMINATION OF SIZE AND DISTRIBUTION OF HAILSTONES.
E. Alfaro-bou. Sep 73, 17p NASA-TM-X-2817, L-8953

Descriptors: *Hail, *Ice formation, *Precipitation (Meteorology), *Recording instruments, Equipment specifications, Performance tests, Simulators, Test facilities.

For abstract, see STAR 1121

N73-30568/2GA PC$3.25/MF$1.45
Direction de la Meteorologie Nationale, Paris (France).
THE STATISTICS OF EXTREME VALUES SUR LA STATISTIQUES DES VALEURS EXTREMES.
J. Bessemoulin. May 73, 24p MONO-89
Language in French.

Descriptors: *Extremum values, *Meteorological parameters, *Statistical analysis, France, Periodic variations, Statistical weather forecasting, Temperature.

For abstract, see STAR 1121

N73-30624/3GA PC$8.00/MF$1.45
Finnish Meteorological Inst., Helsinki.
PRECIPITATION AND SNOW COVER DATA, 1970 (METEOROLOGICAL YEARBOOK OF FINLAND, VOLUME 70, PART 2).
1972, 117p ISBN-951-697-010-9
In English and Finnish.

Descriptors: *Precipitation (Meteorology), *Snow, Diurnal variations, Finland, Tables (Data), Weather stations.

For abstract, see STAR 1121

N73-30625/0GA PC$10.75/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
NORMAL PROBABILITIES FOR CAPE KENNEDY WIND COMPONENTS: MONTHLY REFERENCE PERIODS FOR ALL FLIGHT AZIMUTHS. ALTITUDES 0 TO 70 KILOMETERS.
L. W. Falls. 16 Apr 73, 172p NASA-TM-X-64771

Descriptors: *Cape kennedy launch complex, *Normal density functions, *Wind profiles, Rocket sounding, Statistical analysis, Tables (Data).

For abstract, see STAR 1121

N73-30626/8GA PC$5.50/MF$1.45
Bureau of Meteorology, Melbourne (Australia).
MONTHLY CLIMATE DATA, SURFACE, AUSTRALIA, AUGUST 1972.
Aug 72, 69p

Descriptors: *Australia, *Climatology, *Meteorological parameters, Tables (Data), Weather forecasting.

For abstract, see STAR 1121

N73-30627/6GA PC$10.25/MF$1.45
Colorado State Univ., Fort Collins. Dept. of Civil Engineering.
A COMPARISON OF A COAXIAL FOCUSED LASER DOPPLER SYSTEM IN ATMOSPHERIC MEASUREMENTS.
Final Report.
S. Karaki. 25 Jun 73, 161p NASA-CR-124355
Contract NAS8-26234

Descriptors: *Anemometers, *Atmospheric turbulence, *Doppler effect, *Lasers, *Wind measurement, Computer programs, Flow distribution, Meteorological parameters.

For abstract, see STAR 1121

N73-30628/4GA PC$3.00/MF$1.45
Institut Royal Meteorologique de Belgique, Brussels.
CLIMATOLOGICAL OBSERVATIONS OBSERVATIONS CLIMATOLOGIQUES, BULLETIN MENSUEL, MAI 1973.
Monthly Bulletin, May 1973.
May 73, 15p
In French and Dutch.

Descriptors: *Belgium, *Meteorological parameters, *Tables (Data), Atmospheric moisture, Beta particles, Fallout, Precipitation (Meteorology), Storms (Meteorology), Sunlight, Wind (Meteorology).

For abstract, see STAR 1121

N73-31577/2GA PC$5.25/MF$1.45
Texas A&M Univ., College Station.
A COMPILATION OF STUDIES FROM ATMOSPHERIC VARIABILITY EXPERIMENT (AVE).
J. R. Scoggins, H. E. Fuelberg, R. D. Carlson, R. W. Phelps, and D. G. Bellue. Aug 73, 198p NASA-CR-2304
Contract NAS8-26751

Descriptors: *Atmospheric turbulence, *Rain, *Vertical motion, *Weather forecasting, Adiabatic conditions, Meteorological charts, Meteorology, Vorticity equations.

For abstract, see STAR 1122

N73-31578/0GA PC$6.75/MF$1.45
Utrecht State Univ. (Netherlands).
APPLICATIONS OF TURBULENCE MEASUREMENTS OVER LAKE FLEVO.
Ph.D. Thesis.
J. Wieringa. 28 Jun 73, 94p

Descriptors: *Air currents, *Anemometers, *Gusts, *Temperature measuring instruments, *Turbulent flow, Atmospheric turbulence, Ground wind, Lakes, Precipitation (Meteorology), Wind profiles.

For abstract, see STAR 1122

N73-31579/8GA PC$6.00/MF$1.45
Weapons Research Establishment, Salisbury (Australia).
MEASUREMENTS OF THE BASIC ATMOSPHERIC PARAMETERS AT WOOMERA USING THE FALLING SPHERE, 1971.
S. G. Johnson. Feb 73, 77p WRE-TN-786(WR/D)

Descriptors: *Atmospheric physics, *Falling spheres, *Meteorological parameters, Annual variations, Data reduction, Mesosphere, Sounding rockets.

For abstract, see STAR 1122

N73-31580/6GA PC$3.25/MF$1.45
Secretariat General a l'Aviation Civile, Paris (France).
ON THE MAXIMUM ANNUAL TEMPERATURES OF PARIS SUR LES TEMPERATURES MAXIMALES ANNUELLES A PARIS.
R. Arlery. Jun 73, 24p MN-MONO-90
Language in French.

Descriptors: *France, *Statistical analysis, *Temperature, Annual variations, Climatology.

For abstract, see STAR 1122

N73-31582/2GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Goddard Inst. for Space Studies, New York.
SIMULATION STUDIES AND THE DESIGN OF THE FIRST GARP GLOBAL EXPERIMENT.
R. Jastrow, and M. Halem. 1972, 29p NASA-TM-X-69613

Descriptors: *Environment simulation, *Meteorological parameters, *Weather stations, Atmospheric models, Error analysis, Meteorological satellites, Networks, Numerical analysis.

For abstract, see STAR 1122

PATENT-3 491 358/GA Not available NTIS
Department of the Navy Washington D C
ATMOSPHERIC TURBULENCE DETECTION SYSTEM.
Patent,
John J. Hicks. Filed 2 Feb 68, patented 20 Jan 70, 3p Rept nos. PAT-APPL-702 640,
Government-owned invention available for licensing. Washington, D.C. 20231 $0.50.

Descriptors: (*Clear air turbulence, Detection), (*Meteorological radar, *Patents), Doppler radar.
Identifiers: PAT-CL-343-5.

The invention relates generally to systems for detecting atmospheric turbulence and more particularly to an improved air turbulence detection radar system adapted to detect clear air turbulence.

PB-224 513/2GA PC$4.50/MF$1.45
Washington Univ., Seattle. Div of Marine Resources.
ARCTIC ICE DYNAMICS JOINT EXPERIMENT. AIDJEX BULLETIN NO. 22, AUGUST 1973. ARCTIC DATA BUOYS,
Pat Martin, and Alma Johnson. Aug 73, 140p
AIDJEX-Bull-22, AIDJEX-73-22
Contract NSF-C625

See also AIDJEX-Bull-20 dated May 73, PB-222 057 and AIDJEX-Bull-19 dated Mar 73, PB-221 039.

Descriptors: (*Sea ice, Telemetering data), (*Drift stations, Arctic regions), Weather communications, Pack ice, Data transmission, Oceanographic data, Meterological data. USSR.

AIDJEX Bulletin No. 22 discusses some of the progress made in arctic data buoy technology in both the U.S. and the U.S.S.R. in recent years. Contributions include a history of the Soviet DARMS program and its results to date; a discussion of the SHRAMS and LORAMS data telemetry systems developed by Delco Electronics and results of their deployment in the Arctic; an article on the use of the Navy Navigation Satellite System for determining the position of a drifting buoy; a discussion of the Arctic Data Buoy developed by the National Data Buoy Office of NOAA and some results of its deployment in the Arctic; and two papers on barometric pressure measurements from data buoys.

TT-73-50012/1/GA PC$3.00/MF$1.45
National Oceanic and Atmospheric Administration, Rockville, Md.
SEMIDIURNAL MIGRATIONS OF NORTH ATLANTIC AND SOUTH ATLANTIC SUBTROPIC ANTICYCLONES (POLUSUTOCHNYE MIGRATSII SEVERO-ATLANTICHESKOGO I YUZHNO-ATLANTICHESKOGO SUBTROPICHESKIKH ANTITSIKLONOV),
R. V. Abramov. 1973, 4p
Trans. of Akademiya Nauk SSSR. Doklady, v201 n1 p67-68 1971. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Anticyclones, *Atlantic Ocean), Marine meteorology, Storm tracks, North Atlantic Ocean, South Atlantic Ocean, Diurnal variations, Translations, USSR.

The study attempts to find some pattern in the motion of quasi-permanent centers of action in the Atlantic Ocean.

TT-73-50012/2/GA PC$3.00/MF$1.45
National Oceanic and Atmospheric Administration, Rockville, Md.
MESOSCALE FEATURES OF TROPICAL CONVERGENCE OVER THE ATLANTIC (MEZOMASSHTABNYE OSOBENNOSTI TROPICHESKOI KONVERGENTSII NAD ATLANTICHESKIM OKEANOM),
R. V. Abramov, and L. V. Kool. 1973, 16p
Trans. of mono. Atm'osfernye Protsessy v Tropicheskoi Zone i ikh Svyaz's Protsessami Vnetropicheskikh Shirot, Leningrad, 1971 p15-31. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Atmospheric circulation, *Atlantic Ocean), Marine meteorology, Tropical atmospheres, Convergence, Meteorological data, Translations, USSR.

The paper examines the ICZ (Intertropical Convergence Zone) over the Atlantic common to mesometeorological and synoptic fluctuations. The material comprizes shipborne observations and radio-channel facsimile synoptic charts.

TT-73-50012/3/GA PC$3.00/MF$1.45
National Oceanic and Atmospheric Administration, Rockville, Md.
LARGE-SCALE STRUCTURE OF NORTH ATLANTIC WIND FIELDS (CHERRY KRUPNOMASSHTABNOI STRUKTURY OKEANICHESKIKH VETROVYKH POLEI SEVERO-ATLANTICHESKOGO REGIONA),
R. V. Abramov. 1973, 9p
Trans. of Vsesoyuznoe Geograficheskoe Obshchestvo. Izvestiya (USSR) n2 p123-129 1972.

Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Wind(Meteorology), *North Atlantic Ocean), Marine meteorology, Air water interactions, Wind velocity, Wind shear, Meteorological charts, Translations, USSR.

The main features of the large scale structure of the ocean wind field in the North Atlantic are computed based on ship observations of the actual wind. The resulting characteristics are referred either to the centers of five-degree trapezoids or to the nodes of a five-degree grid.

TT-73-50012/4/GA PC$3.00/MF$1.45
National Oceanic and Atmospheric Administration, Rockville, Md.
SOME CHARACTERISTICS OF TROPICAL DEPRESSIONS OVER THE ATLANTIC (NEKOTORY KHARAKTERISTIKI TROPICHESKIKH DEPRESSII NAD ATLANTICHESKIM OKEANOM),
L. V. Kool. 1973, 5p
Trans. of Meteorologiya i Gidrologiya (USSR) n9 p82-85 1972. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Tropical cyclones, *Atlantic Ocean), Marine meteorology, Depressions, Storm tracks, Translations, USSR.

Synoptic conditions during six tropical depressions intersecting the region of study (16 degrees N, 33 degrees W) are reported including storm tracks and weather changes during their passage.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-768 386/5GA PC$8.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
THE AEROSPACE CORPORATION: PAST, PRESENT, AND FUTURE.
Master's thesis,
James Franklin Wheeler. Sep 73, 122p Rept no. GSM/SM/73-26

Descriptors: (*Air Force, *Research program administration), Systems engineering, Management planning, Air Force budgets, Aircraft industry, Economics, Scientific organizations, Theses.
Identifiers: Aerospace industry, Aerospace Corporation.

The Aerospace Corporation was created in 1960 to provide General Systems Engineering and Technical Direction services to the U.S. Air Force and its contractors in support of national space and missile programs. As the priorities associated with these programs have changed in the intervening thirteen years, the role of Aerospace has changed considerably. Today, Aerospace is pursuing an active diversification program and has gained de facto independence of its founder and primary sponsor, the U.S. Air Force. The contemporary situation needs close examination by a competent agency to determine if the management concept embodied in Aerospace is still the best way to obtain these services and if national security interests are being served adequately. (Author)

BDX-613-885/GA PC$3.00/MF$1.45
Bendix Corp., Kansas City, Mo.
ECONOMIC IMPROVEMENT OF INVENTORY SAMPLING.
C. D. Rinker. Apr 73, 12p
Contract AT(29-1)-613

Descriptors: (*Inventories, *Accounting), Sampling, Statistics.

For abstract, see NSA 28 08, number 20601.

COM-73-11723/6GA PC$3.00/MF$1.45
Chicago Univ., Ill. Center for Urban Studies.
CITY SIZE AND MUNICIPAL SERVICE COSTS.
Research rept.,
John L. Gardner. 8 Jun 72, 19p EDA/OER-73-038

Descriptors: (*Local government, *Financing), (*Services, *Cost analysis), Population(Statistics), Urban planning, Expenses, United States, Income, Capital, Statistical analysis, Mathematical models.
Identifiers: *Municipal services.

The paper reports on research to identify determinants of municipal expenditure levels in the United States. A major goal has been to determine jointly the role of income and wealth levels, city size variables which influence service costs, and characteristics of community decision-making relevant in the determination of expenditure levels. An additional goal has been to develop method for identifying determinants of the levels of municipal service costs from observations on expenditures rather than on service output variables. The proposed model, and the selected regression results presented, are oriented toward revealing the influence of city population size as a shifter of the municipal service cost functions.

COM-73-11726/9GA PC$4.00/MF$1.45
North Carolina Univ., Chapel Hill. Graduate School of Business Administration.
DEFENSE EXPENDITURES AND THE 'RURAL-URBAN BALANCE'.
Research rept.,
Orin C. Patton. 1973, 37p EDA/OER-73-052
Grant EDA-OER-224-G-68-12

Descriptors: (*Defense budgets, *Community relations), (*Sociometrics, *Economic factors), Finance, Impact, Reviews, Statistical analysis, Regional planning, Forecasting, Pattern recognition, Population(Statistics), Income, Multipliers.
Identifiers: Rural urban balance, Defense expenditures.

The paper examines the regional impacts of defense expenditures in a rural-urban context. Rural-urban balance refers to a distribution of population between the rural and urban sectors that will maximize aggregate social welfare. The study is limited to an analysis of the patterns of concentration of variables such as the regional distribution of total personal incomes, defense generated incomes and their different components, and the regional patterns of urban and rural populations. These are compared to the possible consequences of changes in defense expenditures due to changing aggregate levels, changes in the product mix of defense, or changes in the regional distribution of expenditures. The results are analyzed.

PB-224 320/2GA PC$3.00/MF$1.45
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
ANNOTATED BIBLIOGRAPHY ON PERFORMANCE EVALUATION FOR RESEARCH AND DEVELOPMENT,
Gertrude S. McMurray. May 73, 48p APL/JHU-RDO-2
Contract N00017-72-C-4401
This bibliography appeared as Appendix D, Vol. II of Performance Measures for Research and Development, Committee on Federal Labs., Federal Council for Science and Technology, May 1973. Revision of report dated Jan 73.

Descriptors: (*Performance evaluation, *Bibliographies), (*Development,Performance evaluation), (*Research, Performance evaluation), Management planning, Reviews, Problem solving, Operations, Project planning, Benefit cost analysis.
Identifiers: *Annotated bibliographies, *Research and development.

The books, journal papers, and reports in this annotated bibliography were selected as pertinent to the problem of performance measurement of research and development (R and D). Some were included to provide understanding of the nature of R and D, how it is performed and how it is managed, the problems managers face in selecting the most likely to succeed projects from the many proposed R and D projects, and the problem of identifying and assigning value to outputs that often become components of outputs of subsequent R and D projects. Special attention was given (a)to identification of outputs from projects where financial profit was not the motive even if such outputs were not quantifiable.

PB-224 375/6GA PC$3.00/MF$1.45
American Society of Planning Officials, Chicago, Ill.
THE ROLE OF THE HUD AREA OFFICE IN REVIEWING APPLICATIONS FOR PLANNING AND MANAGEMENT ASSISTANCE.
Final rept.
Feb 73, 19p

Descriptors: (*Grants, Regional planning), (*Information systems, Federal budgets), (*Manuals, Financial management), Meetings, Monitors, Reporting, Recommendations, Regulations, Reviewing.
Identifiers: Assistance grants, Application reviewing, Comprehensive planning assistance, Announcements, Management information systems.

The document is written for the staffs of HUD Area offices responsible for reviewing applications for comprehensive planning assistance grants. It should also be of use to the grant applicants. The report is based on material found in HUD's Handbook I (CPM 6041.1A), Handbook II (CPM 6042.1A), and on conversations with HUD personnel. It does not constitute official HUD policy, which is contained in the HUD Handbooks.

PB-224 428/3GA MF$1.45
National Academy of Sciences-National Research Council, Washington, D.C. Div. of Behavioral Sciences.
ENVIRONMENTAL QUALITY AND SOCIAL BEHAVIOR. STRATEGIES FOR RESEARCH.
May 73, 96p*
International Standard Book No. 0-309-02048-4
Report on a Study Conference on Research Strategies in the Social and Behavioral Sciences on Environmental Problems and Policies.
Paper Copy available from National Academy of Science $4.50.

Descriptors: (*Environmental engineering, *Research), (*Social sciences, *Transfer of technology), Methodology, Problem solving, Project planning, Effectiveness, Concepts, Policies.
Identifiers: Environmental change.

The report sets forth strategies for research that will lead to a better understanding of environmental problems and identified effective and socially acceptable means for dealing with these problems. It shows how the methods and concepts of the social sciences may be applied in illuminating environmental problems and developing policies for dealing with them. It delineates strategic approaches--illustrated by specific research tasks--to functional research on environmental processes and policies designed to enhance capabilities for managing environmental change. It also deals with data collection and the development of environmental information systems.

PB-224 497/8GA PC$4.00/MF$1.45
Ohio State Univ. Research Foundation, Columbus.

SCIENCE, POLICY, AND THE UTILIZATION OF SOCIAL TECHNOLOGY.,
Philip M. Burgess, and Louis D. Higgs. Sep 71, 37p
Grant NSF-GT-30
Prepared in cooperation with Office of the Governor of Puerto Rico, and the Inst. for Social Technology in Puerto Rico.

Descriptors: (*Social sciences, Utilization), (*Management, *Policies), Decision making, Management planning, Information systems, Public administration, Systems engineering, Puerto Rico.
Identifiers: Technology utilization, Innovation(Techology), Puerto Rico information and decision environment, Management information systems, Social innovations.

The paper is concerned with the problems of social innovation in the development of social technology that utilizes and applies the best social science as a tool in policy-making. It cases developments of social technology, and in particular, the prototype Planning and Decision Information System (developed as part of PRIDE, the Puerto Rico Information and Decision Environment) in the framework of social science and public policy and the need for knowledge utilization models of knowledge to action processes.

PB-224 552/0GA PC$3.00/MF$1.45
Little (Arthur D.), Inc., Washington, D.C.
INTERGOVERNMENTAL USES OF FEDERAL R AND D CENTERS AND LABORATORIES-EXECUTIVE SUMMARY.
30 Apr 73, 28p
Grant NSF-GR-77
Prepared in cooperation with The Council of State Governments, Lexington, Ky. See also PB-221 402.

Descriptors: (*National government, *Research projects), (*Laboratories, Utilization), Centers, Development, Transfer of technology, State government, Local government, Cooperation, Policies, Networks, Resources, Optimization, Problem solving.
Identifiers: *Research and development, Technical assistance, *Intergovernmental activities.

The executive summary is made of a report on federal R and D. The larger report includes a discussion of policy issues, the federal laboratory network, adaptability of federal laboratories to state problems, and federal laboratory/private sector relationships. It includes a case study of potential resources of relevance to states and local governments, and discusses methods and results of technology transfer.

PB-224 634/6GA PC$3.75/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Dept. of Political Science.
THE MASSACHUSETTS GOVERNOR'S ADVISORY COMMITTEE FOR SCIENCE AND TECHNOLOGY: A COMMITTEE IN SEARCH OF A MISSION.
Final rept.,
Harvey M. Sapolsky. Aug 70, 33p

Descriptors: (*Research, Utilization), (*Organizations, State government), (*Transfer of technology, *Massachusetts), Reviews, Operations, Constraints, Effectiveness, Classifications.
Identifiers: Liaison(Organizations), Research utilization, Advisory groups.

The study describes and analyzes the activities of the Massachusetts Governor's Advisory Committee for Science and Technology during its initial four years of existence. The Committee's operating difficulties are linked to the general problem of a science advisory unit in a state government setting.

5B. Documentation and Information Technology

AD-768 712/2GA PC$3.75/MF$1.45
Defence Research Information Centre Orpington (England)
DRIC LIBRARY BULLETIN, NUMBER 10.
1973, 32p
See also AD-767 766.

Descriptors: (*Scientific research, *Abstracts), Periodicals, Indexes, Information retrieval, Computers, Management engineering, Defense systems, Linguistics, Libraries, Great Britain.
Identifiers: Announcement bulletins.

The bulletin announces selected references to current periodical literature covering the fields of information science and technology, management, reprographic systems and some computer topics considered to be of interest to the Ministry of Defense activities. The bulletin also carries an accession list of books.

CEA-N-1616/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
SYSTEM OF SELECTIVE DISSEMINATION BASED ON NUCLEAR SCIENCE ABSTRACTS.
J. Dirian. Apr 73, 17p
In French. U.S. Sales Only.

Descriptors: Documentation, Information retrieval, Information systems.

For abstract, see NSA 28 07, number 17689.

COM-73-11689/9GA PC$3.00/MF$1.45
California Univ., San Diego, La Jolla. Inst. of Marine Resources.
CALIFORNIA SEA GRANT PROGRAMS CUMULATIVE DIRECTORY 1968-1973.
1973, 35p IMR-74-4, Sea Grant Pub-27 NOAA-73092103
Grant NOAA-043-158-22
Also pub. as University of Southern California, Los Angeles. Marine Advisory Program Rept. no. CMAP-1.

Descriptors: (*Oceanography, Research projects), Directories, California.
Identifiers: Sea Grant program.

The directory of California Sea Grant Programs provides information on programs for the period 1968 - 1973. The following details are given for each project: Title, project leader, affiliation and specific project objectives. The directory is distributed by the California Sea Grant Marine Advisory Program and may be obtained from the University of California.

COM-73-11740/0GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
MANAGEMENT INFORMATION SYSTEMS. A BIBLIOGRAPHY OF SELECTED U.S. GOVERNMENT R AND D ACTIVITY.
1973, 37p* NTIS-BIB-73-02

Descriptors: (*Information systems, *Bibliographies), (*Management systems, Bibliographies), Services, Development, Data processing, Computer systems programs, Organizations, Models, Military operations, Environmental engineering, Urban development, Regional planning, Transportation, Education, Health, Aerospace engineering.
Identifiers: Information processing, Management support systems, *Management information systems, On line systems.

The bibliography contains 208 selected abstracts of research reports on management information systems created by the NTIS on-line search system--NTISearch. The abstracts are divided into three groups: Development; computer hardware and software needed; and applications. The applications section is subdivided into: Educational, environmental and natural resources; medicine and public health; military; space; transportation; and urban and regional development.

COM-73-50879/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INFORMATION FOR A CHANGING SOCIETY. SOME POLICY CONSIDERATIONS.
Final rept.,
M. P. Piganiol, S. Balke, L. M. Branscomb, S. Hamada, and H. T. Hookway. 1971, 46p
Pub. in Organization for Economic Cooperation and Development, Paris (France) 1971 46p.

Descriptors: (*Information systems, *Social organization), Social change, Organizations, Data storage, Research, Econometrics, Management, Policies, Concepts.

Early in 1969 an Ad Hoc Group on Scientific and Technical Information was formed to explore the nature and needs for scientific and technical information and data in science, the economy and society, and how these needs may be met through changes in the structures, technologies and policies, and management concepts. The Ad Hoc Group reached 13 conclusions and recommendations dealing with the scope of action of OECD, the content and procedure of information systems, education for information system needs, and international cooperation. The report describes the observations and arguments leading to the conclusions and recommendations.

LBL-1400/GA PC$7.60/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
INORGANIC MATERIALS RESEARCH DIVISION ANNUAL REPORT, 1972.
Apr 73, 231p
Contract W-7405-eng-48

Descriptors: (*Chemistry, *Research programs), (*Metallurgy, Research programs), (*Ceramics, Research programs), (*Solids, Research programs), Chemical reactions, Electrochemistry, Physical chemistry, Alloys, Crystal defects, Electron microscopy, Fabrication, Metals, Microstructure, Superconductivity, Thermodynamics, Cryogenics, Electrical properties, Electronic equipment, Far infrared radiation, Josephson junctions, Semiconductor materials, Spectroscopy, Mechanical properties.

For abstract, see NSA 28 08, number 18594.

N73-30910/6GA PC$4.25/MF$1.45
Witwatersrand Univ., Johannesburg (South Africa). School of Mechanical Engineering.
GOLDEN JUBILEE RESEARCH BULLETIN.
Apr 72, 43p ISBN-0-85494-200-9, REPT-52

Descriptors: *Abstracts, *Flight mechanics, *Information retrieval, *Research and development, *Solar collectors, Dynamic tests, Nucleate boiling, Pressure effects.

For abstract, see STAR 1121

N73-31348/8GA PC$3.00/MF$1.45
Rice Univ., Houston, Tex. Inst. for Computer Services and Applications.
PHASE 1 OF THE EARTH RESOURCES DATA ANALYSIS PROGRAM.
Final Report, Jun. 1972 - May 1973.
Jun 73, 9p NASA-CR-133982
Contract NAS9-12776

Descriptors: *Earth resources program, *Research projects, Algorithms, Decomposition, Ibm computers, Nonparametric statistics, Probability density functions.

For abstract, see STAR 1122

N73-31867/7GA PC$5.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SIGNIFICANT ACCOMPLISHMENTS IN SCIENCES: GODDARD SPACE FLIGHT CENTER, 1972.
1973, 223p NASA-SP-331
Conf-Proc. Of a Symp., Greenbelt, MD., 7-8 Nov. 1972.

Descriptors: *Applications technology satellites, *Astrophysics, *Earth resources, *Geophysics, *Space programs, Astronomical models, Imaging techniques, Remote sensors, Solar energy, Stellar evolution.

For abstract, see STAR 1122

N73-31920/4GA PC$4.25/MF$1.45
Michigan Univ., Ann Arbor. Engineering Psychology Lab.
RESEARCH ON PROBABILISTIC INFORMATION PROCESSING.
Final Report.
W. Edwards. Jul 73, 43p NASA-CR-133918, REPT-08901-F
Contract NGL-23-005-171

Descriptors: *Information systems, *Probability theory, Computerized simulation, Decision making, Manned space flight, Spacecraft control.

For abstract, see STAR 1122

ORNL-TM-3814/GA PC$4.50/MF$1.45
Oak Ridge National Lab., Tenn.
IMPLEMENTATION AND MODIFICATION OF THE CHEMICAL ABSTRACTS SERVICE NAME-MATCH SYSTEM, PHASE I.
H. J. Hamilton, C. A. Giles, and D. Altom. Jul 73, 49p
Contract W-7405-eng-26

Descriptors: Information retrieval, Information systems, Programming.

For abstract, see NSA 28 07, number 17690.

PB-224 501/7GA PC$4.25/MF$1.45
Environmental Quality Systems, Inc., Rockville, Md.
DEVELOPMENT AND PILOT-TESTING OF AN AUTOMATIC INFORMATION DISSEMINATION SYSTEM.
Completion rept.
Sep 73, 108p* W74-00003, OWRR-W-175(9075)(1)
Contract DI-14-31-0001-9075

Descriptors: (*Industrial waste treatment, Information systems), (*Sewage treatment, *Information systems), Information retrieval, Mathematical models, Computer programs, Recommendations, Methodology, Distributing.
Identifiers: *Automatic information dissemination systems.

An automatic information dissemination system (AIDS) flexible enough to accomodate a wide variety of user needs for technical information was developed and successfully pilot-tested. Methods for accelerating the application of research results were studied using mathematical models and computer programs useful in the design of wastewater treatment facilities as a sample technical area. Engineering firms with design experience were directly consulted to verify their needs for models and programs, and to solicit their views on effective dissemination techniques. Based on the engineers' comments, a system was developed to satisfy individual information needs by automatically disseminating the appropriate level of detail on each model or program. The levels of detail are cumulative.

PB-224 546/2GA PC$6.00/MF$1.45
British Library Lending Div., Boston Spa (England).
BLL ANNOUNCEMENT BULLETIN. A GUIDE TO BRITISH REPORTS, TRANSLATIONS AND THESES.
Oct 73, 78p BAB-73-10
See also report dated Sep 73, PB-223 316.

Descriptors: (*Research, Great Britain), (*Indexes(Documentation), *Technical reports), Translations, Theses, Government, Industries, Universities.
Identifiers: Announcement bulletins.

The announcement bulletin lists British report literature and translations produced by British government organisations, industry, universities and learned institutions, as well as some doctoral theses accepted at British universities during and after 1970. All items listed are held by the BLL.

PB-224 547/0GA PC$4.50/MF$1.45
British Library Lending Div., Boston Spa (England).
LIST OF BOOKS RECEIVED FROM THE USSR AND TRANSLATED BOOKS.
Oct 73, 49p LBRU-182
See also report dated Sep 73, PB-223 318.

Descriptors: (*Books, USSR), (*Indexes(Documentation), Books), Sociology, Mathematics, Physics, Engineering, Chemistry, Medicine, Electronics, Agriculture, Industries, Construction, Great Britain, Libraries, Translations.

The list of books from the U. S. S. R. is arranged in broad subject groups, approximately in U. D. C. order, sub-divided by authors in the order of the Cyrillic alphabet. Translated Russian books are included as a separate section following the main part of the list, also in subject groups; sub-divided by authors in the order of the Roman alphabet.

PB-224 548/8GA PC$4.25/MF$1.45
British Library Lending Div., Boston Spa (England).
INDEX OF CONFERENCE PROCEEDINGS RECEIVED BY THE BLL. CONFERENCE NUMBERS 73-05633 TO 73-06266.
Oct 73, 42p ICP-73
See also report dated Sep 73, PB-223 314.

Descriptors: (*Indexes(Documentation), *Meetings), Libraries, Great Britain, Proceedings, Agriculture, Behavior, Chemistry, Biology, Medicine, Computers, Industries, Physics, Food, Transportation, Management.

All types of conference proceedings are covered, including those which appear in serial form, those reporting individual conferences and published as books and those published as parts of normal serials. The list is in two parts. The first part lists the details of the conference indexed as follows: Title of conference proceedings; Place and date of conference; Filing position at the B—L; Conference number. The second part is a list of subject keywords taken from the titles of the conference proceedings.291

PB-224 628/8GA PC$4.50/MF$1.45
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).
AUSTRALIAN SCIENCE INDEX. VOLUME 17, NUMBER 6, JUNE 1973.
Jun 73, 50p
Index of Articles published in Australian Scientific and Technical Serials. See also Volume 17, no. 4, PB-222 771.

Descriptors: (*Indexes(Documentation), Research), Physics, Astronomy, Mathematics, Chemistry, Engineering, Geography, Biology, Medicine, Agriculture, Australia.

Contents:
Physical sciences, Engineering, Technology; Biological sciences, Agriculture.

PB-224 670/0GA PC$5.75/MF$1.45
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).
CSIRO ABSTRACTS, VOLUME 21, NUMBER 9, SEPTEMBER 1973.
Sep 73, 73p
Abstracts of CSIRO published papers translations. See also Volume 21, no. 8 dated Aug 73, PB-222 919.

Descriptors: (*Research, *Abstracts), Australia, Biology, Chemistry, Engineering, Food processing, Agriculture, Mineralogy, Textiles, Translations.

Abstracts of papers by officers of the following Divisions are included in the issue: Animal genetics, Animal health, Animal physiology, Applied chemistry, Building research, Engineering, Physics, Entomology, Environomental mechanics, Fisheries and oceanography, Food research, Irrigation reasearch, Mineral chemistry, Plant industry, Protein chemistry, Textile industry, Tropical agronomy, Wildlife research.

PB-224 800/3GA PC-GPO/MF$1.45-NTIS
Michigan Dept. of Natural Resources, Lansing. Water Resources Commission.
MICHIGAN WATER RESOURCES ENFORCEMENT AND INFORMATION SYSTEM,
Gary Guenther, Daniel Mincavage, and Fred Morley. Jul 73, 165p W74-00701, EPA-R5-73-020
Paper copy also available GPO $1.45 as EP1.23/3:73-020, and EPA-R5-73-020.

Descriptors: (*Water resources, *Information systems), Michigan, Water pollution, Law enforcement, Data processing, Information retrieval, Evaluation, Expenses, Microfilm.
Identifiers: *Water Information System for Enforcement(WISE), *Storage and Retrieval of Water Quality Data(STORET), Computer graphics, Interactive computer graphics.

The project demonstrated an interactive Federal/state water pollution control, enforcement, and information system, including interactive computer graphics as a method of output presentation. Two systems were interfaced: Michigan's Water Information System for Enforcement (WISE) and EPA's STORET system. The WISE system is used to alert enforcement personnel to problems through exception reporting, and to provide follow-up information on these problems. STORET is used as a storage and retrieval system for water quality and inventory information. As information enters WISE, certain inputs are coded for storage in STORET. The interface mechanism is a common numbering system. Because WISE is modular in design, it can be used in part or in total by other agencies. The demonstration indicated that careful consideration should be given to the information that will comprise the computer file. Administrative, procedural, and auditing techniques should be completely set down before proceeding with management's commitment to the system. Microfilm should be used when feasible, both as Computer Output Microfilm (COM) and in manual files. (Modified author abstract)

PB-224 897/9GA PC$5.75/MF$1.45
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).

AUSTRALIAN SCIENCE INDEX, VOLUME 17, NUMBER 7. JULY 1973.
Jul 73, 72p
Index of articles published in Australian scientific and technical serials. See also Volume 17, no. 6, dated Jun 73, PB-224 628.

Descriptors: (*Research, Indexes(Documentation)), Physics, Chemistry, Engineering, Biology, Agriculture, Australia.

Contents:
Physical sciences, engineering, technology; biological sciences, agriculture.

SLA-73-5592/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex. New Mexico Univ., Albuquerque.
LEXICOGRAPHIC CORRELATION OF DOCUMENTS.
W. C. Burd, and D. R. Morrison. 1973, 20p CONF-730711-1

Descriptors: (*Information retrieval, *Correlations), Computers, Documentation.

For abstract, see NSA 28 07, number 17692.

5C. Economics

AD-768 446/7GA PC$3.75/MF$1.45
Harvard Univ Cambridge Mass
INFORMATION AND ECONOMIC BEHAVIOR.
Technical rept.,
Kenneth J. Arrow. Sep 73, 34p Rept no. TR-14
Contract N00014-67-A-0298-0019
Report on Project on Efficiency of Decision Making in Economic Systems.

Descriptors: (*Economics, *Decision making), Information theory, Probability, Uncertainty.
Identifiers: Resource allocation, Market research, Consumers, Capital.

The paper surveys the ways in which recognition of limitations of information available to economic agents affects the workings of the system and the way in which the propositions of economic theory need restatement. The key point is the fact that probability distributions over economic variables are conditional upon signals on other, apparently irrelevant variables; further, this information is differentially available to different individuals and requires resources to acquire and transmit. Among the economic phenomena to which the information concept is relevant are (1) the response of the system to variables other than current prices, e.g.., quantities and past prices; (2) research about both engineering and markets; (3) the possible disadvantages of information-gathering; (4) the incentive to emit signals, as in advertising and the acquisition of educational credentials; (5) the development of organizations as an economy in information acquisition and their costs of coordination; and (6) the prevention of some markets from existing and the preservation of other markets through non-market activities, including the development of ethical codes. (Author)

COM-73-11697/2GA PC$7.75/MF$1.45
Centaur Management Consultants, Inc., Washington, D.C.
EVALUATION OF IMPACT OF TOURISM/RECREATION PROJECTS FOR ECONOMIC DEVELOPMENT ADMINISTRATION. VOLUME I. EVALUATION RESULTS AND METHODOLOGY.
Jun 73, 366p* EDA-73-043
Contract EDA-6001-2112-36732
Paper copy also available from NTIS $21.00/set of 3 reports as COM-73-11696-SET.

Descriptors: (*Economic development, Projects), (*Recreation, Federal budgets), (*Travel, *Regional planning), Evaluation, Public works, Reviews, Legislation, Organizations, Policies, Impact, Management planning.
Identifiers: Technical assistance, Tourism, Success and failure.

Volume 1 of a three-volume report dealing with the evaluation of the Economic Development Administration's tourism/recreation public works and technical assistance programs describes the objectives and related background information, the EDA and other federal agency tourism/recreation activities, and the research approach. The report contains three appendices which include a detailed summary of the tourism/recreation activities in federal agencies other than EDA, a complete presentation of the methodology applied in evaluating the impact of EDA's tourism/recreation program, and a description of the methods and data associated with evaluating project employment and income multipliers and selected income and employment ratios.

COM-73-11698/0GA PC$7.00/MF$1.45
Centaur Management Consultants, Inc., Washington, D.C.
EVALUATION OF IMPACT OF TOURISM/RECREATION PROJECTS FOR ECONOMIC DEVELOPMENT ADMINISTRATION. VOLUME II. APPENDIX D. INDIVIDUAL REVIEWS OF PUBLIC WORKS TOURISM/RECREATION PROJECTS.
Jun 73, 322p* EDA-73-045
Contract EDA-6001-2112-36732
Paper copy also available from NTIS $21.00/set of 3 reports as COM-73-11696-SET.

Descriptors: (*Economic development, Projects), (*Public works, Impact), Recreation, Travel, Economic forecasting, Management planning, Community relations, Organizations, Political objectives, Demand(Economics), Publicity, Cost analysis, Financing, Maintenance.
Identifiers: Technical assistance, Tourism, *Economic impact.

Volume 2 of a three-part report dealing with the evaluation of the Economic Development Administration/s tourism/recreation public works and technical assistance programs is an appendix which provides detailed information for each of the 28 Public Works projects included in this survey. The focus of these individual project discussions is on the economic impact (as opposed to profitability or recreational benefits) of the project.

COM-73-11699/8GA PC$8.25/MF$1.45
Centaur Management Consultants, Inc., Washington, D.C.
EVALUATION OF IMPACT OF TOURISM/RECREATION PROJECTS FOR ECONOMIC DEVELOPMENT ADMINISTRATION. VOLUME III. APPENDIX E. INDIVIDUAL REVIEWS OF TECHNICAL ASSISTANCE TOURISM/RECREATION PROJECTS.
Jun 73, 425p* EDA-73-044
Contract EDA-6001-2112-36732
Paper copy also available from NTIS $21.00/set of 3 reports as COM-73-11696-SET.

Descriptors: (*Economic development, Federal budgets), (*Project planning, Reviews), Projects, Evaluation, Factor analysis, Organizations, Community relations, Public administration, Cost analysis, Environmental engineering, Management, Facilities, Objectives, Effectiveness.
Identifiers: Technical assistance, Tourism, Priorities.

Volume 3 of a three-volume report dealing with the evaluation of the Economic Development Administration's tourism/recreation public works and technical assistance programs is an appendix which provides detailed information concerning each of the 53 technical assistance projects included in the survey. Each project discussion includes sections such as background information on the area and applicant, information on the development study process prior to the Technical Assistance study, the technical assistance study objectives, an evaluation of each study report, study recommendations, implementation results, reasons for implementation results, and an overall evaluation of the report.

COM-73-11728/5GA PC$5.25/MF$1.45
North Carolina Univ., Chapel Hill.
THE CONCEPTUAL SYNTHESIS OF FINANCIAL INSTITUTION STRUCTURE AND PERFORMANCE IN UNDERDEVELOPED REGIONS.
Research rept.,
Charles H. Ufen. 1973, 62p EDA/OER-73-045
Grant EDA-OER-384-G-71-10

Descriptors: (*Financing, *Organizations), (*Banking business, *Capital), Reviews, Marketing, Evaluation, Interactions, Economic analysis, Regions, Constraints, Development, Recommendations, Concepts.
Identifiers: Capital markets.

The paper presents an appraisal of the capital market institutions and their interaction on the local level. It is an overview of what local capital markets are presumed to be like, and directs its main thrust at the local capital markets in underveloped areas of an economically developed nation. Part One reviews the nature of local capital markets and provides the setting for the discussion of local banking markets. Part Two analyzes the structure of banking competition. Part Three examines market interaction among other financial institutions. Part Four discusses the impediments to full participation by the institutions in the regional development process, and presents some suggested proposals for improving the level of this participation.

COM-73-11734/3GA PC$5.50/MF$1.45
Texas A and M Univ., College Station. Industrial Economics Research Div.
AN ECONOMIC INVENTORY OF RECREATION AND TOURISM WITHIN THE TEXAS COASTAL ZONE,
Billie I. Ingram. Aug 73, 215p TAMU-SG-73-209
NOAA-73100201
Grant NOAA-043-158-18

Descriptors: (*Economic development, *Coasts), (*Resources, *Texas), Inventories, Recreation, Travel, Reviews, Methodology, Statistical data.
Identifiers: Tourism, Counties, Sea Grant program.

An economic inventory is made of existing and available proposed public and private recreation and tourism units within the Texas coastal zone. The volume includes a comprehensive literature review, a concise description of basic data for each of the 36 coastal counties, an explanation of methodology, the presentation of the public and private economic data, and a bibliography. The Texas coastal zone is seen as having the potential for becoming one of the leading recreational and tourism areas in the United States.

COM-73-11748/3GA PC$4.25/MF$1.45
Franklin Inst. Research Labs., Philadelphia, Pa.
INDUSTRY, INNOVATION AND THE MUNICIPAL MARKET.
Final rept.,
John F. Blair, Jr. 15 Oct 73, 103p* FIRL-F-C3431
EDA-73-046

Descriptors: (*Industrial engineering, *Urban planning), (*Public administration, *Urban development), Procurement, Reviews, Optimization, Economic development, Industrial relations, Marketing, Productivity, Systems engineering, Local government, Policies, Recommendations, Pennsylvania.
Identifiers: Technological development, Innovations, Philadelphia(Pennsylvania).

The summary report is made on work done under the auspices of the Economic Development Administration and funded through The Experimental Technology Incentives Program (ETIP). It delineates the form and content of the policies and programs required to develop the municipal local government market into a force for technological innovation and economic development. In addition to this document, a series of eighteen background papers is on file that deals in considerable depth with the more important aspects of the study. This supplementary documentation is referenced in footnotes throughout the text of the summary volume.

COM-73-11782/2GA PC$2.75/MF$1.45
Oregon State Univ., Extension Service, Corvallis. Marine Advisory Program.
FISHING BUSINESS MANAGEMENT AND ECONOMIC INFORMATION,
Frederick J. Smith. Jun 73, 7p SG-6 NOAA-73100204

Descriptors: (*Fisheries, Management), Economic factors, Prices, Expenses, Profits.
Identifiers: Sea Grant program, Commercial fishing.

The bulletin was prepared to assist the reader in understanding some of the terms and concepts of business management as they apply to fishing. Definitions are given for the following terms and concepts: profit, landings, prices and costs, mini manage, maxi manage, and maxi market. Cash gain or loss and return to investment are discussed. Finally, measures of efficiency are delineated.

COM-73-50182/GA PC-GPO/MF$1.45-NTIS/copy
Bureau of International Commerce, Washington, D.C.
OVERSEAS BUSINESS REPORTS.
Myra L. Triplett. 1973-74,approx. 110 issues
Paper copy available from GPO $28.50/year as C1.50:73, $0.30/copy.

The reports present basic authoritative information for exporters, importers, investors, manufacturers, researchers, and those concerned with international trade and economic conditions. For individual reports, see below:

OBR-73-48. Basic Data on the Economy of France. Oct 73, 20p, supersedes OBR-70-61 **COM-73-50182-48/GA COM-73-50182-48/GA**

OBR-73-49. The Andean Common Market: Implications for U.S. Business. Oct 73, 18p **COM-73-50182-49/GA COM-73-50182-49/GA**

OBR-73-51. Selling in Brazil. Oct 73, 12p **COM-73-50182-51/GA COM-73-50182-51/GA**

OBR-73-52. Selling in Singapore. Nov 73, 12p **COM-73-50182-52/GA COM-73-50182-52/GA**

COM-73-50835-01/GA PC-GPO/MF$1.45-NTIS
Department of Commerce, Washington, D.C.
COMMERCE TODAY. VOLUME IV, NUMBER 1.
15 Oct 73, 76p
Paper copy available from GPO $33.00/year as C1.58:4, $1.50/copy as C1.58:4/1.

Descriptors: (*Commerce, Reviews), Economic conditions, Fertilizers, Agriculture, International trade, Residential buildings, Research.

Contents:
Monetary affairs' progress slow in formulating rules;
Agriculture clouded by tight supply of key fertilizer material;
Worldwide talks to reduce trade barriers begin next week;
Housing gains mirror economic growth, many social changes;
Domestic business report;
Science and technology report;
International commerce report.

COM-73-50835-02/GA PC-GPO/MF$1.45-NTIS
Department of Commerce, Washington, D.C.
COMMERCE TODAY. VOLUME IV, NUMBER 2.
29 Oct 73, 68p
Paper copy available from GPO $33.00/year as C1.58:4, $1.50/copy as C1.58:4/2.

Descriptors: (*Commerce, Reviews), Economic conditions, Industries, International trade, Ports, Cargo transportation.

Co
ntents:
GNP growth:
Current rate close to target;
Some manufacturing industries expect 5% expansion, some hampered by shortages;
President to set up two advisory groups on export expansion;
Talks in USSR, Poland, Hungary, Yugoslavia can build trade;
US port modernization to enhance cargo flow, aid world trade growth;
Domestic business report;
International commerce report.

COM-73-50869/9GA PC-GPO/MF$1.45-NTIS
Bureau of Economic Analysis, Washington, D.C.
LONG TERM ECONOMIC GROWTH: 1860-1970.
Jun 73, 329p BEA-LTEC60-70-73
Paper copy available from GPO $4.45 as C56.102:Ec 7/860-970.

Descriptors: (*Economic analysis, United States), (*Economic development, Statistical data), Growth, Trends, Reviews, Time series analysis, Standards, Performance evaluation, International relations, Charts, Output, Input, Industries, Regions, Manpower, Capital.
Identifiers: Gross national product.

The report contains almost 1,200 annual time series to accommodate a wide variety of explanations of economic growth and standards for judging performance. More than 60 charts enable users to pick out at a glance the series and trends that concern him the most. Users can determine growth rates for any series and time span from reference tables. Special growth triangles show growth rates for all possible combinations of years for selected series.

COM-73-70071/8GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. SHOES AND SLIPPERS. JANUARY 1973.
Mar 73, 9p M31A(73)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233, $1.50/year, $0.15/copy.

Descriptors: (*Industries, Economic surveys), (*Shoes, Production), Tables(Data), Footwear, Manufacturing, Consumption, International trade.
Identifiers: *Current industrial reports.

For footwear, except those with sole vulcanized to fabric upper, data are given on: Quantity of production, by kind of footwear and by type of upper; quantity of production and shipments, by type of establishment; production and type of outsole; and quantity of production and quantity and value of shipments by selected geographic divisions and States. Quantity of shipments of shoes and slippers with sole vulcanized to fabric upper, by type, is also presented. Data are presented for the current month and preceding month, with comparative figures for the current month a year ago. A summary showing quantity and value of shipments and quantity of production of shoes and slippers, by type, for the current month and each of 24 preceding months is also included.

COM-73-70072/6GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. CLAY CONSTRUCTION PRODUCTS. JANUARY 1973.
Mar 73, 8p M32D(73)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233, $1.50/year, $0.15/copy.

Descriptors: (*Industries, Economic surveys), (*Structural clay products, Production), Tables(Data), Manufacturing, Bricks.
Identifiers: *Current industrial reports.

For the current and preceding month, data are given on quantity of production and quantity and value of shipments of: Brick (building or common and face) for the United States, geographic divisions, selected States, and regional marketing areas as established by the Structural Clay Products Institute; and clay construction products (except brick) for the United States and geographic divisions. A summary showing quantity of production and quantity and value of shipments of principal types of clay construction products, by type, for the current month and each of 24 preceding months is included.

COM-73-70073/4GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. INDUSTRIAL GASES. SUMMARY FOR 1972 (PRELIMINARY).
May 73, 3p M28C(72)-13
Paper copy available from Bureau of the Census, Washington, D.C. 20233, $1.50/year, $0.15/copy.

Descriptors: (*Industries, Economic surveys), (*Gases, Production), Tables(Data), Acetylene, Carbon dioxide, Hydrogen, Nitrogen, Oxygen, Argon.
Identifiers: *Current industrial reports.

The annual summary includes data on production and quantity and value of shipments of industrial gases for the United States. For selected industrial gases, data appear for shipments by method of distribution, primary production by months, and number of establishments reporting production by state. Data by geographic area are shown for production and shipments of acetylene, carbon dioxide, hydrogen, nitrogen, and oxygen, and for shipments of argon.

COM-73-70074/2GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. COMPLETE AIRCRAFT AND AIRCRAFT ENGINES, JANUARY 1973.
Monthly rept.
Mar 73, 5p M37G(73)-1
Price includes Rept. no. M37E series.
Paper copy available from Bureau of the Census, Washington, D.C. 20233, $2.50/year, $0.15/copy.

Descriptors: (*Aircraft industry, Economic surveys), (*Aircraft, Production), Tables(Data), Manufacturing, Commercial aircraft, Passenger aircraft, Transport aircraft, Aircraft engines, Aircraft equipment, Helicopters, International trade.
Identifiers: *Current industrial reports.

Data are presented on: Quantity and value of shipments and unfilled orders of complete civilian aircraft and aircraft parts (excluding engines and engine parts); quantity and value of shipments of complete engines and engine parts; and quantity and value of civilian aircraft, parts, and accessories for export from the United States. Data are for the current and preceding month, with comparative data for the current month a year ago. Included is a summary showing quantity and value of shipments and unfilled orders of complete civilian aircraft and aircraft engines for the current month and each of 24 preceding months.

PB-224 553/8GA PC$3.00/MF$1.45
Oregon Univ., Eugene.

A $12 BILLION TURNAROUND IN THE U.S. TRADE BALANCE. IS IT FEASIBLE. A SIMULATION ANALYSIS.
External research study,
Raymond F. Mikesell. 20 Jul 73, 43p* XR/RECS-73-9

Descriptors: (*International trade, United States), (*Balance of payments, Inequalities), Revisions, Feasibility, Negotiations, Economic analysis, Improvement, Foreign countries, Mathematical models, Simulation.
Identifiers: Monetary systems, Deficits, Simulation models.

Current negotiations on reform of the international monetary system, and the upcoming trade negotiations, take place against a background of general agreement that the persistent US balance of payments deficit must be corrected. One approach conceives the need for an improvement of between $9 and $13 billion in the US balance of trade. The present study concludes that a turnaround of this magnitude, or even one in the $6 to $12 billion range, is probably not feasible.

PB-224 687/4GA PC-GPO/MF$1.45
Bureau of Labor Statistics, Washington, D.C.
PRODUCTIVITY AND ECONOMY. REVISED 1973 EDITION.
Final rept.
1973, 69p DOL-BLS-B-1779
Paper copy available from GPO $0.95 as stock no. L2.3:1779.

Descriptors: (*Economic analysis, Productivity), (*Industrial relations, Econometrics), United States, Trends, Labor relations, Comparison, Industries, Prices, Employment, Cost analysis, Growth, Factor analysis, Manpower, Capital, Investments, Profits.
Identifiers: *Technological change, Man hours.

The chartbook is designed to show what productivity is and how it operates. The first part shows how productivity has developed over time, the second presents changes in factors that are influenced by productivity, and the third traces trends in various factors that influence productivity.

PB-224 732/8GA PC$9.00/MF$1.45
Earth Satellite Corp., Washington, D.C.
EVALUATION OF ECONOMIC AND SOCIAL BENEFITS AND COSTS OF DATA FROM ERTS-A (PHASE I).
Final rept.
24 Jul 72, 138p USGS-DO-73-012
Contract DI-14-08-0001-13222
Prepared in cooperation with Booz-Allen Applied Research, Bethesda, Md. See also PB-224 733.

Descriptors: (*Benefit cost analysis, *Scientific satellites), Methodology, Natural resources, Aerial reconnaissance, Remote sensing.
Identifiers: ERTS-A satellite, *Earth resources survey system.

Because of the intense interest in future satellite applications and the need to support each step in the Earth Resources Satellite (ERS) Program with objective evaluations of economic utility, numerous studies have been conducted to estimate the potential benefits and cost savings from an earth resources satellite system. Over 350 experiments using ERTS-A imagery have been approved by NASA in an attempt to establish and advance the potential uses for earth resources information. The earth resources community now desires to translate the results of these experiments into the benefits which might be derived from an operational earth resources satellite (ERS) system and to determine whether those benefits justify the costs for the system. To develop a methodology for conduct of the required cost-benefits study, three parallel study contracts were let in May, 1972. This report represents one of those studies. It expands upon the baseline presented in the Earthsat-Booz, Allen proposal for the study, and outlines in detail the specific steps recommended for conduct of a thorough cost-benefits study.

PB-224 733/6GA PC$18.00/MF$1.45
General Research Corp., Santa Barbara, Calif.
EVALUATION OF ECONOMIC AND SOCIAL BENEFITS AND COSTS OF DATA FROM ERTS-A (PHASE I).
Final rept.
Jul 72, 318p CRC-CR-1-321 USGS-DO-73-013
Contract DI-14-08-0001-13220
See also PB-224 732 and PB-224 734.

Descriptors: (*Benefit cost analysis, *Scientific satellites), Methodology, Natural resources, Aerial reconnaissance, Remote sensing.
Identifiers: ERTS-A satellite, *Earth resources survey system.

The objective of the study planned int this report is to determine the economic, social, and environmental costs and benefits which would result from a continuing Earth Resources Survey (ERS) system. Our technical approach comprises nine distinct tasks: information acquisition, experiment assessment, experiment analysis, applications analysis, ERS system cost analysis, macroeconomic and distributional analysis, International impact analysis, social and environmental impact analysis, and summary reporting. ERTS-A experiments will be virtually the entire source of data.

PB-224 734/4GA PC$14.50/MF$1.45
Michigan Univ., Ann Arbor. Willow Run Labs.
DESIGN OF A STUDY TO EVALUATE BENEFITS AND COST OF DATA FROM THE FIRST EARTH RESOURCES TECHNOLOGY SATELLITE (ERTS-A).
Final rept.,
G. J. Zissis, K. P. Heiss, and R. A. Summers. Jul 72, 250p Rept. no. 11215-1-F USGS-DO-73-011
Contract DI-14-08-0001-13221
See also PB-223 732.

Descriptors: (*Benefit cost analysis, *Scientific satellites), Methodology, Natural resources, Aerial reconnaissance, Remote sensing.
Identifiers: ERTS-A satellite, *Earth resources survey system.

This report presents the results of an investigation of methods of evaluating the benefits and cost of operational information gathering and analysis systems based on the technology developed in the Earth Resources Technology Satellite (ERTS-A) experiment presently being conducted by the National Aeronautics and Space Administration. The investigation considers economic, environmental, social, and educational benefits of such systems. The report describes the approach and methodology recommended for an in-depth investigation of this subject to be conducted during Phase two.

PB-224 789/8GA PC$3.50/MF$1.45
Clark Univ., Worcester, Mass.
THE COMMERCIAL DEMAND FOR GOLD IN THE UNITED STATES,
Roger C. Van Tassel, and Constantine Michalopoulos. Aug 73, 66p* BuMines-OFR-64-73
Grant G0-190092 (ME-18)

Descriptors: (*Gold, *Demand(Economics)), Output, Commerce, Utilization, Trends, Dentistry, Economic forecasting, United States, Prices.
Identifiers: Jewelry, Commercial uses.

The report analyzes the 1969 projection of commercial demand for gold by major end use in the United States, with additional data for 1969-72. The report presents the summary of the end use projection of gold use for 1978 for the assumed gold prices of $52 per troy ounce and $70 per troy ounce. It also analyzes the commercial demand for gold in the rest of the world. The report discusses the role of the price of gold and the existing projections for gold use in the rest of the world.

PB-224 819/3GA PC$6.25/MF$1.45
Iowa State Univ., Ames.
AN ECONOMIC ANALYSIS OF ALTERNATIVE GRAIN TRANSPORTATION SYSTEMS: A CASE STUDY.
Final rept. on Phase I,
C. Phillip Baumel, Thomas P. Drinka, Dennis R. Lifferth, and John J. Miller. Nov 73, 254p* FRA-OE-73-4

Descriptors: (*Grains(Food), *Transportation), (*Economic analysis, *Cargo transportation), (*Income, Optimization), Rail transportation, Highway transportation, Trucks, Waterway transportation, Barges, Rates(Costs), Investments, Iowa.
Identifiers: Dual mode transportation, Alternatives, Fort Dodge(Iowa).

The report presents the results of research conducted to determine which grain transportation system would yield the highest net income in a 6 1/2-county area around Fort Dodge, IA. Transportation alternatives considered include the traditional single-car rail system, multiple rail car shipments of 3, 50, 80 and 115 cars, truck, truck-barge and rail-barge. It was assumed that subterminals would be required to load the shipments of 50 cars or more. Also, alternative rail line options were considered; including lines to permit trains with jumbo hoppers to travel at least 35 miles per hour. Total investment requirements were estimated for selected grain distribution systems. The evaluated alternatives were ranked in terms of total joint net income, investment requirements and capacity. Institutional problems related to moving to higher income alternatives are identified.

PB-224 850/8GA PC$3.50/MF$1.45
Mathematics and Computation Lab. (OEP), McLean, Va.
ESTIMATED INFLATIONARY IMPACTS OF PRICE CHANGES IN INPUT-OUTPUT INDUSTRIES,
J. Randolph Norsworthy. Apr 73, 69p MCL-TR-82

Descriptors: (*Prices, *Industrial relations), (*Inflation(Economics), Factor analysis), Industries, Impact, Estimates, Salaries, International relations, Statistical analysis, Economic models.
Identifiers: Price changes, Dollar devaluation, Gross national product.

The report describes the procedure by which estimates are prepared of the impact of price changes by each of 478 industries on the prices of all other industries and on the GNP and GNP component deflators. Present capability resulting from the project is summarized.

PB-224 851/6GA PC$3.00/MF$1.45
Mathematics and Computation Lab. (OEP), McLean, Va.
REAL GROSS OUTPUT OF INPUT-OUTPUT SECTORS 1947, 1950-1957,
Wayne B. Ferrell. Jun 73, 51p MCL-TR-85

Descriptors: (*Industrial relations, Output), (*Economic analysis, *Industries), Data acquisition, Classifications, Sources, Estimates, Statistical data, Computer programming, Value, Deflation(Economics).
Identifiers: Economic deflators.

The data development described in this report is an extension of work performed in 1967 involving the preparation of annual and quarterly figures for real gross output, by input-output sector, for 1958-1966. The report contains comparable figures for real gross output by input-output sector, for the years 1947, and 1950-1957, together with a description of the methods used in deriving the output figures. (Modified author abstract)

PB-224 853/2GA PC$2.75/MF$1.45
Mathematics and Computation Lab. (OEP), McLean, Va.
AN ECONOMIC INTERPRETATION OF THE ENERGY-GNP RATIO,
Ernst R. Berndt, and David O. Wood. Jun 73, 19p (14) MCL-TR-87

Descriptors: (*Economic analysis, Energy), Productivity, Consumption, Partial differential equations, Econometrics.
Identifiers: Production functions, Gross National Product.

The purpose of the report is to present an economic interpretation of the energy--GNP ratio that lends itself to rigorous empirical analysis. Using a neoclassical model of the derived demand for input factors of production, it is shown that the energy--GNP ratio has a consistent economic interpretation only when the inputs to GNP (value added) are weakly separable, in the sense of Leontief, from the energy inputs. Even when this condition is satisfied the model indicates the ratio may vary due to changes in relative prices, indicating that changes in the ratio are not necessarily identified with structural changes in the economy. (Author)

5D. History, Law, and Political Science

AD-769 072/0GA PC$3.00/MF$1.45
Stanford Research Inst Menlo Park Calif Strategic Studies Center
AMERICAN-ALLIED RELATIONS IN TRANSITION. A REPORT ON THE CONFERENCE SPONSORED BY THE STRATEGIC STUDIES CENTER ON 3-6 MAY 1973 IN JUAN-LES-PINS, FRANCE.
Technical note,
Wynfred Joshua, and Sheldon T. Rabin. Aug 73, 35p* Rept no. SSC-TN-2625-1
Contract DAHC15-73-C-0380, ARPA Order-2520

Descriptors: (*Political science, *Symposia), Deterrence, Nuclear weapons, Arms control, Military strategy, United States government, USSR, Europe.
Identifiers: International relations, NATO, SALT(Strategic Arms Limitation Talks), Strategic arms limitation talks.

The paper presents a summary of the discussions at the colloquium held at Juan-les-Pins, France, 3-6 May 1973. The report seeks to reflect the general tenor as well as the substantive issues discussed during the colloquium sessions. The focus of the conference was on the development of new security concepts that could meet the Soviet challenge. Whenever possible, distinctions between the views of European and American participants have been made. The final section consists of the specific recommendations of the conference. Two appendices are attached; Appendix A lists the papers presented at the colloquium, and Appendix B the attendees, both participants and observers. (Author)

PB-223 776/6GA PC$3.50/MF$1.45
Research Inst. of National Defence, Stockholm (Sweden).
A CONCEPT FORMULATION OF A RULE FOR THE LIMITATION OF THE DEVELOPMENT OF SOME FRAGMENTATION WEAPONS WHICH MAY CAUSE SUPERFLUOUS INJURY ACCORDING TO INTERNATIONAL LAW,
Bo Janzon. Sep 73, 26p FOA-2-A2577-M2

Descriptors: (*Arms control agreements, *International law), (*Fragmentation ammunition, *Kill probabilities), Arms proliferation, Wounds, Wound ballistics, Fragmentation, Probability theory, Fragmentation warheads, Sweden.
Identifiers: Rules of war, Overkill.

Statistical calculations regarding multiple fragment hits have been performed and applied to a number of typical existing and recently developed fragmentation warheads. This has made it possible to formulate a rule intended to obstruct the use of certain warhead types which may be considered to give rise to a high rate of superfluous injury. The rule is not entirely contradictory to the demands for higher warhead efficacy and cost-efficiency. A further study of the implications of the rule, and of possible ways to improve it, should be performed.

PB-224 639/5GA PC$3.75/MF$1.45
American Justice Inst., Sacramento, Calif.
JUVENILE DRUG ABUSE PREVENTION PROJECT. SANTA CLARA COUNTY JUVENILE PROBATION DEPARTMENT. FIRST YEAR EVALUATION REPORT,
John W. Pearson. Nov 71, 90p* LEAA-NI-72-09-0001-B
Grant LEAA-NI-72-09-0001

Descriptors: (*Juvenile delinquency, *Drugs), (*Law(Jurisprudence), Projects), Education, Counseling, Prevention, Reviews, Evaluation, California.
Identifiers: *Drug abuse, *Probation, Santa Clara County(California).

The purpose of the program was to divert court processing for a large number of minors referred for the first time for drug offenses, with no apparent increase in risk. The document includes a brief background review of the development of the program, research activities and methods, and a discussion relating to each of the grant proposal objectives. The appendices contain the type of data collected, data analysis procedures, and supporting data not contained in the text. (Modified author abstract)

PB-224 699/9GA PC$7.75/MF$1.45
American Justice Inst., Sacramento, Calif.
REGIONAL CRIMINAL JUSTICE PLANNING: HOW ARE FUNDING PRIORITIES ESTABLISHED,
M. K. Howard. May 73, 114p LEAA-NI-72-09-0001-D
Contract LEAA-NI-72-09-0001

Descriptors: (*Law enforcement, *Project planning), Payment, Financing, Mathematical models, California, Grants, Selection, Statistical analysis.
Identifiers: *Criminal justice, Santa Clara County(California).

Methods used by Criminal Justice Regional Planning Units (RPU's) in ranking project proposals, and use of these methods in Santa Clara County, California are presented. Four methods were employed in analyzing the RPU's 1973 grant year ranking processes: (1) Graphic and tabular displays, (2) analysis of member disagreement, (3) cluster analysis, and (4) capturing judgment policies. A summary of the questions answerable through each method and a summary of the kinds of resources needed for the use of each method are presented. It was suggested that although each method can stand alone, an in-depth analysis should proceed from graphic and tabular displays to analysis of member disagreement to cluster analysis and finally to capturing judgment policies. It was concluded that the method of capturing judgment policies offers the most powerful and definitive approach to determining project rankings. (Modified author abstract)

PB-224 701/3GA PC$5.00/MF$1.45
American Justice Inst., Sacramento, Calif.
SANTA CLARA COUNTY NARCOTICS BUREAU EVALUATION--JUNE 1971 TO DECEMBER 1972.
Dec 72, 57p LEAA-NI-72-09-0001-A
Contract LEAA-NI-72-09-0001

Descriptors: (*Narcotics, Control), (*Law enforcement, *California), Projects, Information systems, Criminology, Organizations, Management methods, Records, Systems engineering, Methodology, Effectiveness, Drugs.
Identifiers: Santa Clara County(California), Arrest statistics.

Project objectives include: (1) reducing the supply and demand for illegal narcotics, (2) establishing a law enforcement drug council, (3) establishing a specially trained code of law enforcement officers, (4) improving operational interrelationships between agencies, (5) establishing effective public education and instruction programs, (6) increasing effectiveness of narcotics enforcement of smaller law enforcement agencies and (7) establishing a central narcotics record system. The project produces several useful and transferable measurement tools. (Modified author abstract)

5E. Human Factors Engineering

AD-769 017/5GA Reprint
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
AN EXPLORATORY STUDY OF ARM-REACH DYNAMICS UNDER SEVERAL LEVELS OF GRAVITY,
Nilss M. Aume. 1973, 16p Rept no. AMRL-TR-71-34
Availability: Pub. in Ergonomics, v16 n4 p481-494 1973.

Descriptors: (*Arms, Mobility), Physiology, Gravity, Acceleration, Torque, Energy, Velocity, Human engineering.
Identifiers: Reach capability, Biodynamics, Biomechanics.

Four adult male subjects made vertical reaching movements, upward and downward, over 10, 20, and 30 in. distances; these movements were performed under weightlessness (0.0g), Martian gravity (0.38g), Earth gravity (1.0g), and 1.3G. The subject's arm was considered as consisting of two rigid parts: the upper arm and the lower arm. Three instantaneous velocities over the entire movement were derived from film records to describe the motion of these parts: the linear velocities of the centres of mass in both the horizontal and vertical directions, and the angular velocity of each part. Reach times, both maximum angular velocities and maximum lower arm velocity were selected as criterion measures. (Modified author abstract)

N73-30061/8GA PC$3.75/MF$1.45
Japan Broadcasting Corp., Tokyo. Technical Research Labs.
NHK TECHNICAL MONOGRAPH NO. 21.
Mar 73, 33p

Descriptors: *Eye movements, *Human beings, *Pattern recognition, *Peripheral vision, Central nervous system, Electro-optics, Gestalt theory, Psychology, Sensory perception.

For abstract, see STAR 1121

N73-30079/0GA PC$3.00/MF$1.45
Translation Consultants, Ltd., Arlington, Va.
ERGONOMICS: PRINCIPLES AND RECOMMENDATIONS, NO. 1.
V. P. Zinchenko. Jun 73, 237p NASA-TT-F-716
Contract NASW-2030
Tran-Transl. Into English of the Book "Ergonomika: Printsipy I Rekomedatsii, Vyt. 1" Moscow, All-Union Sci. Res. Inst. For Aesthetic Styling in Eng., 1970 246 p.

Descriptors: *Automatic control, *Human factors engineering, *Man machine systems, *Systems engineering, Emotions, Environmental engineering, Social factors, Systems analysis.

For abstract, see STAR 1121

5F. Humanities

JPRS-60274/GA PC$3.50/MF$1.45
Joint Publications Research Service, Arlington, Va.
TRANSLATIONS FROM PHILOSOPHICAL SCIENCES. NUMBER 4, 1973,
V. S. Gott. 12 Oct 73, 65p
Trans. of Nauchnye Doklady Vysshei Shkoly. Filosofskie Nauki (USSR) n4 p18-22, 22-35, 47-54, 146-151, 164-170 1973.

Descriptors: (*Philosophy, USSR), Research, Sociometrics, Cybernetics, Human behavior, Environmental engineering, Mass media, Meetings, Translations.

The report contains articles on aspects of philosophical studies in the USSR.

5G. Linguistics

AD-768 451/7GA PC$4.25/MF$1.45
Texas A and M Univ College Station
USERS' EVALUATION OF MACHINE TRANSLATION, GEORGETOWN MT SYSTEM, 1963-1973.
Final rept. 7 Nov 72-4 Mar 73,
Bozena Henisz Dostert. Aug 73, 114p* RADC-TR-73-239
Contract F30602-70-C-0118
Prepared in cooperation with California Inst. of Tech., Pasadena.

Descriptors: (*Machine translation, Effectiveness), (*Reviews, Machine translation), Vocabulary, Semantics, Linguistics, Questionnaires, Russian language, English language.
Identifiers: Interviews.

The report documents results of an evaluative study aimed at determining the utility of unedited Russian-English machine translation in operational environment. The study is based on performance of the Georgetown MT System at the AEC Oak Ridge National Laboratory (Oak Ridge, Tenn.) and EURATOM Common Research Center (Ispra, Italy) during the period 1963 through 1973. Part I contains information pertaining to production volume, suppliers/users of machine translation services, production cost, computer environment, and improvements since 1963 to date. Part II describes the methodology supplied in collection and analysis of utility assessments. Part III consisting in analysis of individual assessments, contains a wide range of uniformly favorable responses elicited by questionnaire and personal interview from American users of AEC machine translation services in the U.S.A. and users of EURATOM machine translation services in Italy, Belgium, Germany, and Holland. Results are presented. (Modified author abstract)

AD-768 976/3GA PC$3.75/MF$1.45
Purdue Univ Lafayette Ind School of Electrical Engineering
STUDIES ON WORD SPOTTING.
Final rept. 1 Jan-30 Nov 72,
George W. Hughes, Kung-Pu Li, Yoshiyuki Horii, and Thomas B. Snow. 30 Apr 73, 80p Rept no. TR-EE-73-23 AFCRL-TR-73-0312
Contract F19628-72-C-0154

Descriptors: (*Speech, Acoustic properties), (*Sound signals, Images), Phonetics, Speech recognition, Sound pitch, Voice communication systems, Intelligibility.
Identifiers: *Words(Language), Speech analysis, Phonology, *Acoustic measurement.

Three aspects of the research activities of the Speech Research Laboratory, School of Electrical Engineering, Purdue University are reported: Segment classification in continuous speech; speech reconstituted from spectra of reduced dimensionality: a study of intelligibility; and statistical characteristics of voice fundamental frequency. Results of these experiments, all of which involve computer processing of speech data, are related to the acoustical correlates of segmental and prosodic linguistic features of speech and to the efficient transmission of information in speech communication systems. (Author)

COM-73-11717/8GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
MACHINE TRANSLATION. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Sep 73,
Edward J. Lehmann. Oct 73, 105p* NTIS-WIN-73-066

Descriptors: (*Machine translation, *Bibliographies), Computer programming, Linguistics, Semantics, Syntax.
Identifiers: *Computer aided translation.

The NTISearch bibliography contains 100 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. Research on machine translation of various languages is presented. Topics concerning syntax, computer programming, computer hardware, and semantics are included. (Author)

5I. Personnel Selection, Training, and Evaluation

AD-768 384/0GA PC$10.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
THE CIVILIAN INDUSTRY PROGRAMS TO COMBAT TECHNICAL OBSOLESCENCE: APPLICATIONS TO THE MILITARY COMMUNICATIONS FIELD.
Master's thesis,
Heiki Ellermets. Sep 73, 159p Rept no. GSM/SM/73-9

Descriptors: (*Electronic equipment, *Transfer of training), (*Personnel management, Obsolescence theory), Air force training, Officer personnel, Communication equipment, Theses.
Identifiers: *Technical obsolescence.

A problem has arisen from the fact that many communications systems staff officers with over ten years of service are trying to utilize their electron tube era education and training to cope with problems in transistors or integrated circuits. The rapidly changing technology causes these communications officers to become obsolete and requires further training to stay abreast of the most current equipment and techniques. The report considers how certain areas of the civilian program could usefully be adapted to provide alternative training programs within the USAF communications field.

AD-768 385/7GA PC$10.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
A MONETARY REPAYMENT MODEL FOR RECOUPMENT OF THE EDUCATIONAL COSTS OF AIR FORCE SPONSORED GRADUATE EDUCATION IN LIEU OF COMPLETION OF AN ACTIVE DUTY SERVICE COMMITMENT.
Master's thesis,
Sanford Dangler Mangold. Sep 73, 165p Rept no. GSM/SM/73-17

Descriptors: (*Air force personnel, *Education), (*Officer personnel, Air force training), Costs, Wages, Personnel management, Theses.
Identifiers: Investments, *Unfulfilled service commitment, Economic models.

The study develops a model which enables the Air Force to initiate recoupment action against any officer, who is separating from active service prior to the completion of a graduate education Active Duty Service Commitment (ADSC). It is set up to determine the amount of money owed by the early exiting officer, at any point in the ADSC. The recoupment model is placed into the framework of the average annual wage rates commanded by individual graduate degrees in the civilian work environment. This wage data is derived from the 1970 Census of the United States population. The procedure is to measure the average wage rate of specific graduate and undergraduate degrees, and to calculate the difference between them. This difference is assumed to approximate an economic measurement of the additional work productivity, that the Air Force can expect from an officer by virtue of his graduate education. This differential amount is then placed into a recoupment scheme, whereby an officer repays the cost of his USAF sponsored graduate education in monetary form, if separated prior to ADSC completion. The model estimates total amount owed by an early exiting officer, as a function of the following variables: the direct cost of the Air Force of the officer's graduate education; the amount of time served in the associated ADSC; the type of graduate degree earned at Air Force expense; and the type of degree possessed by the officer prior to graduate school attendance. (Modified author abstract)

AD-768 401/2GA PC$3.75/MF$1.45
Operations Research Inc Silver Spring Md
EVALUATION OF NJROTC INFLUENCE ON NAVY ACCESSIONS.
Final rept.,
W. Thomas Callahan, Oedies W. Davis, and Michael W. Brown. 30 Sep 73, 87p Rept no. ORI-TR-779
Contract N00014-73-C-0422

Descriptors: (*Recruiting, *Naval personnel), (*Adolescents, *Armed forces reserves), Statistical data, Questionnaires, Statistical analysis.
Identifiers: Naval Junior Reserve Officers Training Corps, Evaluation, Surveys.

The study attempted to discern and explain a positive relationship between Naval Junior Reserve Officers Training Corps (NJROTC) and Navy enlistments. Through analysis of enlistments of persons from the 91 Zip Code Areas when NJROTC programs are present, it was found that no consistently positive relationship between NJROTC and Navy enlistments exists. On the basis of a small number of interviews with Naval Science Instructors and students, it was also tentatively concluded that NJROTC units vary greatly; that they are fully integrated with the curricula of the local schools; that they appear to be subject to the same pressures as are other voluntary courses; that the Naval Science instructors appear to be sensitive to overall school and community trends. (Author)

AD-768 415/2GA PC$4.50/MF$1.45
Mcdonnell Douglas Astronautics Co-East St Louis Mo Engineering Psychology Dept
PREDICTING MAINTENANCE TASK DIFFICULTY AND PERSONNEL SKILL REQUIREMENTS BASED ON DESIGN PARAMETERS OF AVIONICS SUBSYSTEMS.
Technical rept.,
Larry M. Lintz, Susan L. Loy, Gerald R. Brock, and Kenneth W. Potempa. Aug 73, 134p AFHRL-TR-72-75
Contract F33615-71-C-1620

Descriptors: (*Electronic technicians, *Performance(Human)), (*Maintenance personnel, Performance(Human)), Communication systems, Flight control systems, Human engineering, Mathematical prediction, Mathematical models, Regression analysis, Time, Special purpose computers, Display systems, Target acquisition, Airborne, Questionnaires, Analysis of variance, Fire control systems, Radar equipment, Inertial navigation.
Identifiers: Avionics, Task performance, Difficulty levels, Rating scales, *Skill levels.

The relationships among subsystem design characteristics, personnel skill characteristics, personnel skill characteristics, and job performance were investigated for avionics subsystems. A list of design characteristics was established, and functional loops and line replaceable units were selected from ten subsystems representing navigation, flight control, communications, and fire control subsystems. Experienced supervisors identified high and low skill maintenance personnel. These supervisors associated performance times and error probabilities for three maintenance tasks - an easy task, a difficult task, and a complete functional checkout task. Supervisors also rated each task on a scale of difficulty.

AD-768 448/3GA PC-GPO/MF$1.45-NTIS
National Science Foundation Washington D C
UNEMPLOYMENT RATES AND EMPLOYMENT CHARACTERISTICS FOR SCIENTISTS AND ENGINEERS, 1971.
Final rept.,
J. James Brown. Jan 72, 209p Rept no. NSF-72-307
Sponsored in part by Advanced Research Projects Agency, Arlington, Va.
Availability: Paper copy available from GPO $1.75 as NS1.2:UN2/971.

Descriptors: (*Scientific personnel, *Employment), (*Engineering personnel, *Industrial relations), Professional personnel, Statistical data, Factor analysis, Classification, Background.
Identifiers: Status changes.

The report presents an analysis of the data collected from 300,000 scientists and 100,000 engineers in the spring of 1971 with emphasis on their employment status. Measured were the employment status changes which took place during the period spring 1970 to spring 1971. Unemployment rates are presented in terms of such parameters as age, field of science and technology, degree level, type of employer, and work activity.

AD-768 734/6GA PC$3.50/MF$1.45
Naval Training Equipment Center Orlando Fla
TRAINING IN THE UNDERWATER TERRAIN NAVIGATION AND RECONNAISSANCE TRAINER SIMULATOR.
Technical rept.,
Rex C. Thomas. Sep 73, 51p Rept no. NAVTRAEQUIPC-IH-222

Descriptors: (*Simulators, Deep submergence), (*Underwater navigation, *Naval training), Ocean bottom topography, Oceanology, Underwater vehicles, Training devices, Mission profiles, Design, Instruction manuals.
Identifiers: *Manned submersibles, Star I vessel, Benthos 5 vessel, Scenarios, Asherah vessel, Alvin vessel, Recommendations, Instructors guides, Aluminaut vessel, Trieste vessel.

The report describes the human factors contribution to the Physical Sciences Laboratory Underwater Terrain Navigation and Reconnaissance Simulator program. There are three major components. One is the development of eight four-hour mission scenarios of graduated difficulty. The second is an instructor guide for the instructor. The third consists of a numer of recommendations for improving the training capability of the vehicle as a submersible simulator. (Modified author abstract)

AD-768 756/9GA PC$12.75/MF$1.45
Naval Training Equipment Center Orlando Fla
MAN-THE FOCUS OF THE TRAINING SYSTEM. PROCEEDINGS OF THE NAVAL TRAINING EQUIPMENT CENTER AND INDUSTRY CONFERENCE (6TH), HELD ON NOVEMBER 13-15, 1973.
Nov 73, 648p Rept no. NAVTRAEQUIPC-IH-226

Descriptors: (*Flight simulators, Effectiveness), (*Naval aviation, *Training devices), Performance(Human), Weapon systems, Economics, Cost effectiveness, Simulation, Instructors, Optics, Submarines, Symposia.
Identifiers: Computer aided instruction.

A compilation of papers on a variety of technical and training subjects related to training device technology and training methodology. The conference theme 'Man--The Focus of the Training System' provides a common ground for the examination of the various aspects of the training system which contributes to the effective development of man's capability to carry out the tasks to which he is assigned. (Modified author abstract)

AD-768 894/8GA PC$5.50/MF$1.45
Operations Research Inc Silver Spring Md
COORDINATION AND INTEGRATION OF MILITARY EDUCATION WITH NATIONAL CAREER EDUCATION. PHASE I: CAREER DEVELOPMENT IN SELECTED OCCUPATIONS.
Technical rept.,
Michael W. Brown, Janice B. Smith, and W. Thomas Callahan. 22 Oct 73, 201p Rept no. ORI-TN-795
Contract N00014-73-C-0422

Descriptors: (*Armed Forces(United States), *Job analysis), (*Naval aviation, *Social psychology), (*Education, Feasibility studies), Personnel management, Attitudes, Motivation, Electronic technicians, Mathematical models.
Identifiers: Career development, Avionics.

The report describes the initial phase of a study of coordination and integration of career education in the military with the national career education effort. The study was undertaken in recognition of the potential significance of the military as a career education resource in society, and in recognition of the need to develop a concept of career education in the military that is consonant with national concepts. This first study phase examined the career development experiences of avionics (aviation electronics) technicians in each of the service branches. Detailed information on career progression, job functions, and employment requirements for four comparable civilian occupations was assembled. Career development in each of the service branches over approximately 20 years is compared to each of four civilian occupations. The results of these comparisons are discussed. (Modified author abstract) Portions of this document are not fully legible.

AD-768 923/5GA PC$3.50/MF$1.45
Human Resources Research Organization Alexandria Va
RESEARCH ON SYNTHETIC TRAINING: DEVICE EVALUATION AND TRAINING PROGRAM DEVELOPMENT.
Technical rept.,
Paul W. Caro, Robert N. Isley, and Oran B. Jolley. Sep 73, 57p Rept no. HumRRO-TR-73-20
Contract DAHC19-73-C-0004

Descriptors: (*Training devices, Army aircraft), (*Teaching methods, *Instrument flight), Transfer of training, Performance tests, Army training, Performance(Human), Experimental design, Feasibility studies.
Identifiers: *Synthetic training, Evaluation, Fixed wing aircraft.

Two studies were conducted to evaluate a fixed-wing instrument procedures training device and to develop a training program for use with the device. In the first study, a group of trainees at the U. S. Army Aviation School who recieved synthetic instrument flight training with the new device were compared with a control group of trainees who did not. The second study was concerned with development and evaluation of an instrument flight training program designed especially for use with the new device. It appears that the training concepts have application to other programs utilizing training devices. (Modified author abstract)

AD-768 996/1GA PC$3.00/MF$1.45
George Washington Univ Washington D C Graduate School of Arts and Sciences
COMPENSATION AND NON-COMPENSATION INDUCEMENTS AND THE SUPPLY OF MILITARY MANPOWER.
Technical rept.,
Sheldon E. Haber. 30 Jul 73, 28p Rept no. TR-1142
Contract N00014-67-A-0214-0016
Report on Econometric Research on Navy Manpower Problems.

Descriptors: (*Naval personnel, *Recruiting), (*Personnel management, *Motivation), Feasibility studies, Effectiveness, Predictions.
Identifiers: *Noncompensation inducements, *Compensation inducements, Enlisted personnel, Enlistment.

The paper focuses on several non-compensation inducements to enlistment, namely location and unit guarantees, reduced active service enlistment periods, and formal and informal skill training. The data examined lend support to the view that benefit packages incorporating a variety of non-compensation benefits can result in greater effectiveness of the AVF budget dollar than the current approach which gives primary emphasis to military compensation as the means of attracting young people to military service. (Author)

AD-768 997/9GA PC$2.75/MF$1.45
George Washington Univ Washington D C Graduate School of Arts and Sciences
SOME ASPECTS OF NAVY MANPOWER MANAGEMENT: CAREER MANNING RATIOS, VARIABLE REENLISTMENT BONUSES AND PROFICIENCY PAY.
Technical rept.,
Sheldon E. Haber. 30 Jul 73, 24p Rept no. TR-1146
Contract N00014-67-A-0214-0016
Report on Econometric Research on Navy Manpower Problems.

Descriptors: (*Naval personnel, *Motivation), (*Personnel management, *Recruiting), Attitudes, Management planning, Money, Effectiveness, Reviews.
Identifiers: Variable reenlistment bonuses, Proficiency pay, Incentives.

The variable reenlistment bonus and proficiency pay are discussed as monetary incentives designed to increase the supply of manpower in military specialties experiencing shortages of personnel. The paper examines current Navy practice in assigning these monetary benefits. (Author)

COM-73-11701/2GA PC$3.00/MF$1.45
Colorado Univ., Bolder. Inst. of Behavioral Science.
A CANONICAL APPROACH TO ASSESSING OCCUPATIONAL MOBILITY MATRICES.
Research rept.,
E. M. Beck. Sep 72, 19p EDA/OER-73-034
Prepared in cooperation with Wisconsin Univ., Madison.

Descriptors: (*Socioeconomic status, *Industrial relations), (*Manpower, Mobility), Correlations, Mathematical models, Job analysis, Statistical distributions, Methodology.
Identifiers: Occupational mobility, Occupational position inheritance.

The paper explores a procedure for determining the amount of occupational position inheritance in an occupational structure that avoids translation the origin and destination positions into scale scores. A canonical technique is examined that permits assessment to which origin positions determine destination positions. This procedure involves expressing the occupational positions as binary variables, then obtaining canonical correlations among the sets of binary variables. An application of this approach in investigating the effects of short-term economic diversification upon intragenerational occupational mobility is provided.

COM-73-11710/3GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
JOB SATISFACTION. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Sep 73,
Edward J. Lehmann. Oct 73, 137p* NTIS-WIN-73-060

Descriptors: (*Bibliographies, *Job satisfaction), (*Industrial psychology, Attitudes), Manpower utilization, Personnel management, Industrial relations, Morale, Job analysis, Employment, Personnel development.

The NTISearch bibliography contains 132 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The topics cover studies on generalized and specific areas of job satisfaction, both civilian and military. Emphasis is placed on evaluation and improvement of personnel development and management techniques. Attitude surveys of various socioeconomic groups in organizations are included. (Author)

COM-73-11826/7GA PC$3.75/MF$1.45
Texas A and M Univ., College Station. Coll. of Education.
MARINE OCCUPATIONS IN THE TEXAS COASTAL ZONE,
Beryl McKinnerney, and Donald L. Clark. Jul 73, 79p TAMU-SG-73-606 NOAA-73100203
Contract NOAA-2-35123

Descriptors: (*Vocational interests, *Coasts), (*Employment, *Texas), Reviews, Shipbuilding, Fishes, Shellfish, Harbors, Maintenance, Recreation, Petroleum industry, Specialized training, Research.
Identifiers: Occupations, Sea Grant program, Marine vocations, Careers, Merchant marine, Tourism.

The report is intended for use of high school students, counselors, teachers and curriculum developers who are interested in marine career information. Its purpose is to identify and to describe the marine occupations for prospective employees in the following areas: Fish and foods; harbor maintenance and activities; merchant marine industry; marine recreation and tourism; research and development; petroleum industry; and shipbuilding and repair.

PB-223 970/5GA PC$5.75/MF$1.45
Association of Schools of Allied Health Professions, Washington, D.C.
THE CORE CONCEPT IN ALLIED HEALTH. A 'STATE OF THE ART' DOCUMENT.
Final rept.,
Carolyn N. Burnett. Aug 72, 244p* HRA/AH-73-1
Contract PHS-71-4009

Descriptors: (*Health, *Education), (*Paramedical sciences, Education), Medical personnel, Personnel development, Bibliographies.
Identifiers: *Medical education, *Allied health sciences.

Presented is state-of-the-art report on the core concept as it is implemented in allied health professions education programs. The objective of the report was to bring together information about 'core' which would enable allied health educators to clarify the meaning of the concept in allied health education and to provide a summarization of its implementation with the attendant problems and complexities encountered by others. A literature search and interviews at nine schools were the bases of the report. An annotated bibliography is part of the report.

PB-224 276/6GA PC$2.75/MF$1.45
Nebraska Univ., Omaha. Dept. of Criminal Justice.
A REALISTIC APPROACH TO INNOVATION,
Garth C. Dawson. May 73, 20p
Contract LEAA-NI-72-004-G

Descriptors: (*Police, *Specialized training), (*Criminology, *Nebraska), Projects, Reviews, Problem solving, Community relations, Law enforcement.
Identifiers: Omaha(Nebraska), On job training, Brainstorming, Innovations.

Part of the Omaha police in-service training program was devoted to innovative approaches to solving police department problems and improving community relations. The sessions were an attempt to use the brainstorming technique to elicit new solutions to everyday problems faced by the rank-and-file members of the police department. The report describes the training methodology which was followed and the suggestions offered by the officers. (Author)

PB-224 377/2GA PC$4.75/MF$1.45
University of Southern California, Los Angeles. Div. of Research in Medical Education.
EVALUATION OF INTERACTIVE NETWORKS. FINAL EVALUATION REPORT FOR PLANNING PHASE OF ATS-F SATELLITE HEALTH EXPERIMENTS.
13 Dec 72, 165p* HEW-NLM-72-4(2)
Contract PHS-72-4179

Descriptors: (*Telecommunication, Education), (*Medical services, Telecommunication), (*Spacecraft communication, Telecommunication), (*Information systems, *Health), Evaluation, Experimental design, Data acquisition, Data processing.
Identifiers: *Medical education, Biomedical information systems.

Soon after its launch in synchronous equatorial earth orbit in 1974, the ATS-F satellite will be used for health-related experiments to test its feasibility as a mediating vehicle in the delivery of selected social services. Under the leadership of the NLM's Lister Hill Center, several institutions in the western United States have planned satellite-mediated experiments in medical and health education. USC contracted to assist in planning health experiments using the satellite as a mediating communication link, and to provide an overall evaluation plan for the experiments. The goal of the project is to provide empirical data which will guide system feasibility and design decisions for future applications. Evaluation plans and experimenters' proposals are presented together, for eleven experiments, in order to enable conceptualization of the overall experiment. Experiment design and generalized procedures, as well as an evaluation plan which suggests the data which must be gathered, type of data collection instruments, and recommended data analysis technique, are presented.291

PB-224 407/7GA PC$3.00/MF$1.45
Jorgensen (Roy) and Associates, Gaithersburg, Md.
MANAGING HIGHWAY MAINTENANCE - TRAINING GUIDE AND CATALOG,
Clyde A. Burke. Jan 73, 40p*
Contract FH-11-7600

Descriptors: (*Highways, Maintenance), (*Management training, Specialized training), Manuals, Methodology, Planning, Systems engineering, Personnel management, Supervisors, Engineers, Problem solving, Objectives, Control, Job analysis.
Identifiers: Management by objectives, Highway maintenance.

A model curriculum is reported for training personnel who are responsible for managing highway maintenance field operations. The training is organized and sequenced by five broad areas--management problems, management by objective, work planning, work control and management systems. In each area, one or more training units are provided for each of three general management levels. One level is designed specifically for foremen or crew leaders; another for intermediate supervisors, and the third for field engineers. The curriculum also includes a guide and several manuals for instructors. The Training Guide and Catalog describes the content of each training unit and training approach used.

PB-224 486/1GA PC$4.25/MF$1.45
Environmental Protection Agency, Cincinnati, Ohio. Office of Water Program Operations.
AUDIOVISUAL INSTRUCTION UNITS. TRAINING SUPPORT,
Audrey E. Donahue. Jul 73, 45p EPA-430/1-73-008

Descriptors: (*Environmental engineering, *Visual aids), (*Specialized training, Environmental engineering), Chemical analysis, Safety engineering, Statistics, Waste treatment, Plant engineering, Methodology, Information systems.
Identifiers: Audiovisual instruction.

The catalog contains the title, abstract, references and notes for 33 slide-tape audiovisual programs. Topics concern chemical analyses, safety in treatment plants, statistics and wastewater treatment operations. Information regarding requests for use of these programs is included.

PB-224 502/5GA PC$7.50/MF$1.45
Environmental Protection Agency, Washington, D.C. Office of Education and Manpower Planning.
ABATEMENT AND POLLUTION CONTROL TRAINING AND EDUCATIONAL PROGRAMS PRESENTED BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY.
Rept. for Jul 73-Jun 75.
Jul 73, 106p EPA-430/1-73-009

Descriptors: (*Environmental engineering, *Specialized training), (*Pollution, Control), Air pollution, Water pollution, Catalogs(Publications), Projects, Training programs, Programmed instruction.
Identifiers: Training course descriptions.

The catalog is a compilation of training course descriptions and educational programs in abatement and pollution control scheduled for presentation July 1973 through June 1975 by the United States Environmental Protection Agency. Description of training programs and general information concerning tuition fees, waiver requests, and application forms are included.

PB-224 525/6GA PC$2.75/MF$1.45
California Univ., Los Angeles. Inst. of Industrial Relations.
TRUCKING INDUSTRY TRAINING PROJECT.
Final rept. 15 Nov 71-15 Jul 73,
Donald D. Sanburn. Aug 73, 18p DLMA-
Contract DL-92-06-72-04-6

Descriptors: (*Motor vehicle operators, *Motor trucks), (*Specialized training, Motor vehicle operators), Manpower utilization, Projects, Ethnic groups, Labor unions, Agreements, Reviews, Policies, Problem solving, Inequalities.
Identifiers: Retraining, Seniority, Trucking industry.

The report was prepared under a grant made to investigate the possibilities of establishing an organized system of training for the trucking industry. It discusses attempts to disseminate information on training, learned through operation of an experimental and demonstration project in Pico Rivera, California. It discusses problems of compliance and carry-over seniority for minorities. It indicates the intention of the Teamsters Union and the Trucking Employers, Inc. to establish a system of training for the trucking industry through contractual agreement.

PB-224 529/8GA PC$6.00/MF$1.45
Research Inst. of National Defence, Stockholm (Sweden).
GNOSIS-A SYSTEM FOR COMPUTER AIDED INSTRUCTION,
Jacob Palme. Jul 73, 80p FOA-P-C8373-M3(E5)
Summary in Swedish.

Descriptors: (*Education, *Computer programming), (*Programmed instruction, Sweden), Programming languages, Display devices, Adaptive systems, Learning, Teaching machines, Errors, Console typewriters.
Identifiers: GNOSIS instruction system, *Computer aided instruction, Command systems, Man computer communication.

GNOSIS is a system which makes it simple for a teacher to produce a computerized lesson. The teacher compiles a lesson containing texts and questions and expected answers to the question. The teacher can check the student results and add remedial sections for students with difficulties. Unexpected false answers can be handled by appropriate hints followed by a repetition of the wrongly answered question. GNOSIS is written in Algol for the DEC system 10 computer, but it should not be too difficult to transfer to another computer.

PB-224 545/4GA PC$4.75/MF$1.45
Michigan Univ., Ann Arbor. Center for Research on Utilization of Scientific Knowledge.
COMPETENCY AMONG THE HARD-TO-EMPLOY YOUTHS.
Final rept.,
Nathan Caplan. Jun 73, 172p DLMA-82-24-68-41-1
Contract DL-82-24-68-41

Descriptors: (*Unemployment, *Motivation), (*Industrial relations, *Youths), Manpower utilization, Abilities, Attitudes, Forecasting, Theories, Behavior, Vocational interests, Reviews, Projects, Incentives(Psychology), Unskilled workers, Counseling.
Identifiers: *Hard to employ groups.

The report consists of five chapters: The first evaluates a theory of youth unemployment which particularly pertains to youths who are skillful in nonstandard competencies--the theory of competing competencies. The second illustrates such behavior through the use of a case history. The third presents empirical support for the theory based on data from two large-scale intervention projects. The development of standard and nonstandard competencies is the focus of the fourth chapter. The final one broadens the theoretical discussion and concludes by applying the ideas more precisely to youth unemployment manpower development programs.

PB-224 600/7GA PC$3.00/MF$1.45
Arizona Univ., Tucson. Coll. of Business and Public Administration.
EXPANDING THE BENEFITS OF MANPOWER RESEARCH.
Final rept. Jul 71-Sep 73,
Lawrence R. Klein. Sep 73, 50p DLMA-82-04-71-27(1)
Contract DL-82-04-71-27

Descriptors: (*Manpower studies, Effectiveness), (*Manpower, Research), Utilization, Quality, Evaluation, Upgrading, Technical writing, Standardization, Instructions.

This project used an interdisciplinary group of graduate students to adapt and rewrite the findings of selected studies sponsored by the Office of Research and Development in order to broaden the audience for those findings. The final report assesses the experience in order to develop: (1) Suggestions which other universities could use to plan, organize, and carry out similar projects; (2) guidelines for improving the quality of manpower research to facilitate maximum use of the findings; and (3) practical advice for manpower researchers on how to improve the quality of writing and analysis in their reports.

PB-224 737/7GA PC$4.25/MF$1.45
Center for Governmental Studies, Washington, D.C.
PILOT COMPREHENSIVE MANPOWER PROGRAM: IMPLICATIONS OF ITS EXPERIENCE FOR LOCAL AND STATE MANPOWER ORGANIZATION.
Final rept.,
Howard W. Hallman. Oct 73, 106p* DLMA-21-11-73-44-1
Contract DL-21-11-73-44

Descriptors: (*Employment, Government policy), (*Manpower, Projects), State government, Local government Urban areas, Rural areas, Legislation, Models, Manpower utilization, Coordination, Labor, Management planning.

The Department of Labor has embarked upon a series of pilot projects known as the Comprehensive Manpower Program (CMP) in order to test means for implementing manpower services delivery systems serving whole labor market areas. The CMP provides five metropolitan models, based upon variations in number of counties within the SMSA and types of eligible prime sponsors, but it has no models for several other sizable groups of metropolitan areas. The three statewide CMP projects provide models which might be useful in states where SMSA population is less than 50% but not in the states with a majority of residents living in metropolitan areas. However, the CMP state projects provide useful experience for manpower organization in nonmetropolitan districts in all states.

PB-224 788/0GA PC$6.25/MF$1.45
George Washington Univ., Washington, D.C. Manpower Research Projects.
A LONGITUDINAL STUDY OF OUT-OF-SCHOOL NYC-2 PROGRAMS IN FOUR CITIES. REPORT OF PHASE II (RESEARCH SITES AND ENROLLEE CHARACTERISTICS).
Final rept.,
Regis H. Walter, Margaret L. Magnusson, and Shirley E. Cherkasky. Feb 72, 252p DLMA-41-0-003-09-2
Contract DL-41-0-003-09

Descriptors: (*Manpower utilization, *Youths), (*Employment, Projects), Reference groups, Comparison, Ethnic groups, Sex, Family relations, Age, Unemployment, Education, Specialized training, Attitudes, Motivation, Unskilled workers, Municipalities, Counseling.
Identifiers: Neighborhood Youth Corps, *Out of school youth, Atlanta(Georgia), Baltimore(Maryland), Cincinnati(Ohio), Saint Louis(Missouri).

An experimental study group was constituted by placing new NYC-2 enrollees as they enrolled until N's of approximately 125 subjects in each of four sites (Atlanta, Baltimore, Cincinnati, and St. Louis) were achieved. This group was predominantly black, under 18 years of age, of less than 10th grade education, and without any vocational preparation. Half the study subjects were young women, about half of whom were mothers. Site study groups are compared in terms of race and sex, and the association of such characteristics as schooling and the provision of day care with race and sex is a factor in differential site results with respect to other enrollee characteristics and to program operations.

PB-224 827/6GA PC$21.00/MF$1.45
Cresap, McCormick and Paget, Inc., Washington, D.C.
EFFECTIVENESS AND EFFICIENCY OF NURSING EDUCATION PROGRAMS, VOLUME I: ANNOTATED BIBLIOGRAPHY.
Final rept.
Jun 73, 380p* BHME-71-4(I)
Contract PHS-71-4059
Paper copy also available from NTIS $37.00/set of 3 reports as PB-224 826-SET.

Descriptors: (*Nurses, *Education), (*Nursing, *Bibliographies), Specialized training, Reviews, Effectiveness, Performance evaluation, Aptitudes, Abilities, Economic factors, Projects, Statistical analysis, Requirements, Supply(Economics), Demand(Economics), Trends.
Identifiers: Registered nurses, Career development.

The tree volume study is a review of the available literature to determine the relative effectiveness and efficiency of diploms, associate degree, and baccalaureate nursing education programs in producing the number and quality of registered nurses needed in the nation; and to analyze the cost of nursing education. Volume 1 is an annotated bibliography of the field.

PB-224 828/4GA PC$10.25/MF$1.45
Cresap, McCormick and Paget, Inc., Washington, D.C.
EFFECTIVENESS AND EFFICIENCY OF NURSING EDUCATION PROGRAMS, VOLUME II: REVIEW OF THE LITERATURE.
Final rept.
Jun 73, 161p* BHME-71-4(II)
Contract PHS-71-4059
Paper copy also available from NTIS $37.00/set of 3 reports as PB-224 826-SET.

Descriptors: (*Nurses, *Education), (*Nursing, *Reviews), Reporting, Trends, Employment, Requirements, Public health, Roles(Behavior), Cost analysis, Services, Supply(Economics), Job analysis, Motivation, Job satisfaction, Projects.
Identifiers: Career development, Registered nurses.

The three volume study is a review of the available literature to determine the relative effectiveness and efficiency of diploma, associate degree, and baccalaureate nursing education programs in producing the number and quality of registered nurses needed in the nation; and to Volume two analyzes the cost of nursing education, examines the future professional roles of nurses, assesses supply studies and demand in relation to nurses of different professional capabilities, and the relative capabilities of graduates of the three genres of nursing education.

PB-224 829/2GA PC$8.00/MF$1.45
Cresap, McCormick and Paget, Inc., Washington, D.C.
EFFECTIVENESS AND EFFICIENCY OF NURSING EDUCATION PROGRAMS, VOLUME III: ANALYSIS OF THE LITERATURE.
Final rept.
Jun 73, 118p* BHME-71-4(III)
Contract PHS-71-4059
Paper copy also available from NTIS $37.00/set of 3 reports as PB-224 826-SET.

Descriptors: (*Nurses, *Education), (*Nursing, *Personnel development), Reviews, Public health, Benefit cost analysis, Requirements, Supply(Economics), Projects, Effectiveness, Recommendations, Programmed instruction, Performance evaluation.
Identifiers: Career development, Registered nurses.

The three volume study is a review of the available literature to determine the relative effectiveness and efficiency of diploma, associate degree, and baccalaureate nursing education programs in producing the number and quality of registered nurses needed in the nation; and to analyze the cost of nursing education. Volume three notes that a mild stimulation of the health delivery system by the Federal government, through national health insurance and other health programs, must accom-

pany the stimulation for higher production of nurses under the Nurse Training Act if the desired level of care is to be attained.

PB-224 847/4GA PC$4.50/MF$1.45
Tennessee Univ., Knoxville.
AN INVESTIGATION OF INTRA-FIRM UPWARD MOBILITY AMONG SELECTED SKILLED CRAFTSMEN.
Final rept.,
Clarence Harold Barnes. 27 Jul 73, 136p DLMA-Contract DL-91-47-72-48

Descriptors: (*Craftsmen, Promoting), (*Industrial relations, *Mobility), Upgrading, Manpower utilization, Apprenticeship, Specialized training, Factor analysis, Instruments, Electricians, Project planning.
Identifiers: *Intrafirm advancement, Manpower development.

The objective was to investigate the factors which influence the upward movement of skilled craftsmen within the firm. Particular attention was directed at the importance of apprenticeship training in causing intrafirm upgrading; that is: were apprentice-trained craftsmen more inclined to be promoted than nonapprentice-trained craftsmen. Observed variables discussed are present age, age when became a craftsman, number of years a craftsman with TVA, apprenticeship training, where the individual spent his youth, additional TVA sponsored job-related training, and the craft positions of instrument mechanic and electrician.

PB-224 849/0GA PC$22.75/MF$1.45
Michigan Univ., Ann Arbor. Dept. of Electrical and Computer Engineering.
COMPUTER INSTRUCTIONAL AIDS FOR UNDERGRADUATE CONTROL EDUCATION.
Final rept. Oct 70-Sep 73,
Richard A. Volz, Darryl Conliffe, Michael Dever, Theodore H. Johnson, and Jorge Aravena. Sep 73, 412p NSF-GY8313-73-P1
Grant NSF-GY-8313

Descriptors: (*Control theory, *Programmed instruction), (*Computer programming, *Engineering education), Universities, Computerized simulation, Hybrid computers, Time sharing, Digital computers, Graphic methods.
Identifiers: Hybrid computation, Computer aided instruction.

The computer has been playing an increasingly important role in engineering analysis and design for some time. As graphic time-sharing terminals become more prevalent it will be even more a nautral part of the analysis and design process. It is important that universities introduce their students to these tools. This work has been undertaken to do this in one area, automatic control theory. The emphasis of this work has been the development of computer tools to aid in undergraduate instruction. Both hybrid and digital computation were utilized. A general configuration control system was simulated on a hybrid computation system which is time-shared by five terminals.

TT-72-53188/2/GA PC$3.00/MF$1.45
Office of Education, Washington, D.C.
SELECTED BIBLIOGRAPHY OF EDUCATIONAL MATERIALS IN PAKISTAN. VOLUME 6, NUMBER 2, 1972. PERIOD COVERED APRIL-JUNE 1972.
1972, 57p
Trans. by Geti Saad. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Education, *Pakistan), (*Bibliographies, Education), Translations, Abstracts, Objectives, Planning, Research, Methodology, Documents, Classifications, Students, Instructors, Adults, Children, Management.

A bibliography on educational materials in Pakistan contains abstracts on adult, agricultural, health, Islamic, science, teacher, medical, language, technical, and women's education; educational goals, planning, reforms, research, philosophy, psychology, guidance, and methods; and examinations, libraries, children's literature, and textbooks.

5J. Psychology (Individual and Group Behavior)

AD-768 360/0GA PC$2.75/MF$1.45
New Mexico State Univ University Park Dept of Psychology
QUANTITATIVE MODELS FOR PREDICTING HUMAN VISUAL PERCEPTUAL/MOTOR PERFORMANCE.
Final status rept.,
Warren H. Teichner. Sep 73, 9p
Contract N00014-70-A-0147-0002

Descriptors: (*Visual perception, *Motor reactions), Reaction(Psychology), Performance(Human), Predictions.
Identifiers: Eye movements.

A short discussion of the data base development and analysis of data is presented along with abstracts of reports (Laws of the Visual Choice Reaction Time and Visual Search for Simple Targets) done under this contact. A limited number of reports on eye movements and performance, visual searching, and coding were discussed.

AD-768 372/5GA PC$3.75/MF$1.45
Applied Psychological Services Inc Wayne Pa Science Center
FACTORS INVOLVED IN THE ADJUSTMENT OF LOW APTITUDE PERSONNEL TO THE NAVY AND THEIR USE FOR PREDICTING REENLISTMENT.
Final technical rept.,
Philip J. Federman, Martin R. Lautman, and Arthur I. Siegel. Aug 73, 84p
Contract N00014-73-C-0497

Descriptors: (*Naval personnel, *Adjustment(Psychology)), (*Recruiting, Naval personnel), Attitudes, Performance(Human), Predictions, Motivation, Questionnaires.
Identifiers: Surveys, Correlations, *Low aptitude personnel.

A longitudinal analysis of the reactions of a sample of low aptitude personnel to various aspects of Navy life is presented. Questionnaires were administered at various points during the first enlistment of a cohort sample of category IV sailors. The assessment points sampled were: First week of boot camp; end of recruit training (three months after entering the service); nine months after entry into the service; and termination of the initial enlistment. Factors influencing perception of the Navy at the points sampled are isolated and the predictability of reenlistment from the factors of the first three time periods is stated. (Author)

AD-768 376/6GA PC$3.00/MF$1.45
Minnesota Univ Minneapolis Dept of Psychology
THE STRATFIELD ADAPTIVE COMPUTERIZED ABILITY TEST.
Research rept.,
David J. Weiss. Sep 73, 49p Rept no. RR-73-3
Contract N00014-67-A-0113-0029

Descriptors: (*Achievement tests, Computers), Psychometrics, Test construction(Psychology), Operational readiness.
Identifiers: *Abilities.

Thestratified adaptive (stradaptive) is described as a strategy for tailoring an ability test to individual differences in testee ability. Stradaptive test administration is controlled by a time-shared computer system. The rationale of the method is described as it derives from Binet's strategy of ability test administration and findings concerning peaked tests from modern test theory. The essential elements of stradaptive testing which are considered include the differential entry point, branching rules, and individualized termination criteria. Different methods of scoring the stradaptive test are discussed, as are the implications of individual differences in consistency of test responses within the stradaptive test record. A number of examples of the results of live stradaptive testing are presented and discussed. Implications of additional data derived from stradaptive test response records are considered and related to other psychometric concepts. (Author)

AD-768 410/3GA PC$4.50/MF$1.45
Center for Naval Analyses Arlington Va
JOB SATISFACTION AND JOB TURNOVER,
Arthur P. Maloney. Jul 73, 48p Rept no. CNA-Professional Paper-114

Descriptors: (*Industrial relations, Mobility), (*Personnel, *Motivation), Job analysis, Attitudes, Decision making, Factor analysis, Operations research, Reviews.
Identifiers: *Job satisfaction, *Job turnover.

Change models are considered in relation to studies of factors affecting job-change decisions. This background serves as a framework for critical reviews of recent research on job satisfaction and job turnover. The reviews are followed by an analysis of job turnover during a seven-year period at a medium-sized operations research organization. (Author)

AD-768 741/1GA PC$3.75/MF$1.45
Navy Personnel Research and Development Center Washington D C
ATTITUDES OF NAVAL PERSONNEL TOWARD POLICY CHANGES INITIATED THROUGH Z-GRAMS.
Final rept.,
David B. Greenberger, and Gerry L. Wilcove. Jun 73, 77p Rept no. WTR-73-45

Descriptors: (*Naval personnel, *Attitudes), Questionnaires, Officer personnel, Background, Analysis of variance, Theory, Reviews.
Identifiers: Policy changes, Enlisted personnel, Z grams.

The report deals with perceptions of naval personnel to recent policy changes. Specifically, it was asked: (a) What areas of policy change enter most into a general opinion of Z-grams, and (b) Do selected factors relate to the formation of a particular opinion toward either policy changes or their effects on Navy life. Results are based on responses of 1725 officers and 2640 enlisted men. A number of item response differences are noted among men of varying officer-enlisted status, years of active service, race, sea-shore duty assignment and perceived extent of supervisor's support of Z-grams. (Modified author abstract)

AD-768 878/1GA PC$3.75/MF$1.45
Rochester Univ N Y Graduate School of Management
VALUE ORIENTATION, ORGANIZATIONAL REWARDS, AND JOB SATISFACTION.
Technical rept.,
Wayne F. Cascio. 10 Aug 73, 94p Rept no. TR-82
Contract N00014-67-A-0398-0015

Descriptors: (*Industrial relations, *Organizations), (*Manpower, *Attitudes), Motivation, Reviews, Mathematical models, Theory, Factor analysis, Correlation techniques.
Identifiers: Employee attitudes, *Job satisfaction, Intrinsic values, Extrinsic values, Incentives, Business firms.

The nation-wide sales force (N=540) of a large food and beverage firm responded to a survey

designed to investigate the role of value orientation as a moderator of the relationship between organizational rewards and job satisfaction. From equifinality theory it was hypothesized that individuals who emphasize the intrinsic (extrinsic) aspects of work can achieve the same relative level of overall job satisfaction if intrinsic (extrinsic) organizational rewards match their value orientation. It was also hypothesized that those Ss who were high in intrinsic value orientation and low in extrinsic value orientation would view satisfaction with the work itself as the most significant determinant of their overall job satisfaction. In order to put the hypothesis into empirical perspective several alternative models of job satisfaction were applied to the same data pool. The results are discussed. (Modified author abstract)

AD-768 990/4GA PC$5.50/MF$1.45
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
PRODUCTION SYSTEMS: MODELS OF CONTROL STRUCTURES,
Allen Newell. May 73, 68p AFOSR-TR-73-1904
Contract F44620-70-C-0107, ARPA Order-827
Sponsored in part by Grant PHS-MH-07732.

Descriptors: (*Cybernetics, *Humans), Visual perception, Control systems, Structures, Mathematical models, Programming(Computers), Theory, Memory.
Identifiers: *Information processing(Psychology), Production systems, Stimulus response, Human control structures, Visual information processing.

An exposition is made of the potentiality of production systems as a model of the detailed control structure of humans. A detailed treatment is given of the elementary Sternberg reaction time experiments in binary classification as a means of exhibiting the uses of production systems. The investigation leads to a hypothesis for these experiments different from the usual one of exhaustive search, called the Decoding Hypothesis. (Author)

AD-768 993/8GA PC$3.50/MF$1.45
Minnesota Univ Minneapolis Dept of Psychology
AN EMPIRICAL STUDY OF COMPUTER-ADMINISTERED TWO-STAGE ABILITY TESTING.
Research rept.,
Nancy E. Betz, and David J. Weiss. Oct 73, 53p
Rept no. RR-73-4
Contract N00014-67-A-0113-0029

Descriptors: (*Aptitude tests, Adaptive systems), (*Programming(Computers), *Performance tests), Time sharing, Test construction(Psychology), Management planning, Statistical analysis, Reliability.
Identifiers: Abilities, *Computer aided testing, Two stage testing, Linear testing, Difficulty levels.

In an investigation of new approaches to measuring abilities, a two-stage adaptive test and a conventional peaked test were constructed and administered on a time-shared computer system to students in undergraduate psychology courses. Comparison of the score distributions yielded by the two tests are discussed for variability, distribution, and test-retest stability. Suggestions for possible ways to improve the characteristics of the two-stage testing strategy are offered. (Modified author abstract)

AD-769 073/8GA PC$3.00/MF$1.45
American Institutes for Research Silver Spring Md
METHODS FOR PREDICTING JOB-ABILITY REQUIREMENTS: I. ABILITY REQUIREMENTS AS A FUNCTION OF CHANGES IN THE CHARACTERISTICS OF AN AUDITORY SIGNAL IDENTIFICATION TASK.
Technical rept.,
George R. Wheaton, Ellen J. Shaffer, Angelo Mirabella, and Edwin A. Fleishman. Sep 73, 47p*
Rept nos. AIR-31300-9/73-TR, AIR-R73-5
Contract N00014-72-C-0382

Descriptors: (*Aptitude tests, Employment), (*Auditory acuity, *Performance tests), Memory, Auditory signals, Geometric forms, Identification, Signal-to-noise ratio, Analysis of variance, Test construction(Psychology), Students.
Identifiers: Abilities, Task performance.

The report describes the first study in a program of research dealing with the relationships between the characteristics of human tasks and the abilities required for task performance. The goal of the program is to generate principles which can be used to identify ability requirements from knowledge of the characteristics of a task and of variations in the conditions of task performance. Such knowledge has important implications for both selection and training of personnel. The study investigated the relationship between variations in an auditory signal identification task and consequent changes in the abilities related to identification performance. (Modified author abstract)

JPRS-60222/GA PC$2.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
MODELING AND MATHEMATIZATION IN PSYCHOLOGY,
A. N. Leontev, and E. N. Dzhafarov. 9 Oct 73, 17p
Trans. of Voprosy Psikhologii (USSR) n3 p3-14 1973.

Descriptors: (*Psychology, Matematical models), (*Psychometrics, USSR), Mathematical analysis, Theory, Philosophy, Reviews, Translations.

The report contains an evaluation of procedure for modeling and mathematization in psychology.

SLA-73-5530/GA PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
SHORTCUTS IN HUMAN RELIABILITY ANALYSIS.
A. D. Swain. 1972, 28p CONF-730714-1

Descriptors: (*Man, *Efficiency), Errors, Reliability.

For abstract, see NSA 28 07, number 17810.

5K. Sociology

COM-71-80004-28/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. POPULATION OF CONGRESSIONAL DISTRICTS FOR THE 93D CONGRESS--1970.
Supplementary rept.
Oct 72, 11p CENSUS-70-PC(S1)-28
Paper copy available from GPO $0.25 as C3.233/12:970/28.

Descriptors: (*Census, United States), National government, Tables(Data).
Identifiers: Congressional districts.

The report presents 1970 census population counts for congressional districts of the 93d Congress, which began its session in January 1973. Figures are shown for 429 districts, arranged by state, and for six states where a Representative is elected at large. The table includes total population and population of voting age (18 years and over) for 1970, together with 1960 total population, number of percent change between 1960 and 1970, and percent deviation of the district's population from the State average congressional district population in 1970. Populations shown for each congressional district for 1970 are consistent with the official State population counts. A summary table shows the effect of one-man one-vote legislation on Congressional redistricting.

COM-71-80004-29/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. POPULATION AND HOUSING CHRACTERISTICS FOR THE UNITED STATES BY STATE: 1970.
Dec 72, 75p CENSUS-70-PC(S1)-29
Paper copy available from GPO $1.25 as C3.233/12:970/29.

Descriptors: (*Census, United States), (*Residential buildings, Statistical data), Tables(Data), Ethnic groups, Education, Employment, Income, Houses, Spanish language.
Identifiers: Census tracts, Negroes.

The report shows national and state statistics on various population and housing subjects in a format comparable with the presentations of these subjects in the 1970 Census PHC(1) series on census tract reports. The tables provide a convenient means for users of the tract data to make comparative studies with national and State data on the same subject. The tables in the report cove cover: general, social, and economic characteristics for the total population, the Negro population, and persons of Spanish heritage; labor force and income characteristics for the total population; occupancy, utilization, and financial characteristics of housing units; structural equipment and financial characteristics of housing units with Negro head of household; and characteristics of housing units with household head of Spanish heritage. All data are for the United States, arranged by State, with separate data shown for New York City.

COM-71-80010/GA PC-GPO/MF$76.85-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. GENERAL SOCIAL AND ECONOMIC CHARACTERISTICS.
Final repts.
1971-72,53 issues
Paper copy available from GPO $121.75/set of 53 reports as C3.223/7:970.

The reports present statistics from the 1970 Census of Population on social and economic characteristics of the population. Data are presented on age, nativity, place of birth, and parentage; mother tongue; Spanish heritage; year moved into present house and residence in 1965; school enrollment and years of school completed; vocational training; veteran status; marital history; families and their composition; fertility; work disability; employment status; weeks worked in 1969; activity five years ago; place of work; means of transportation to work; occupation, industry, and class of worker; income; and poverty status. Items such as sex and race are also presented for the purpose of cross-classifications. Statistics are shown by counties, standard metropolitan statistical areas, urbanized areas and urban places for most of the subjects. For prices of individual reports, see below:

CENSUS-70-PC(1)-C22. Maryland. Mar 72, 301p, PC-GPO$2.00, MF$1.45-NTIS

COM-71-80011/GA PC-GPO/MF$349.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. CENSUS TRACTS.
Final repts.
1972,241 issues
Paper copy available from GPO $294.6-/set of 241 reports as C3.233/11:970.

The reports present 1970 census statistics by census tracts on the characteristics of the population and housing units in standard metropolitan statistical areas (SMSA's). Social, labor force, and income characteristics of the population as well as occupancy, utilization, structural equipment, and financial characteristics of housing units are presented in tabular form for component counties, for places of 25,000 or more in the SMSA, and for individual tracts, In addition, for census tracts with Negro and/or Spanish population of specified size, the reports present data on selected population and housing subjects for these groups. For prices of individual reports, see below:

CENSUS-70-PHC(1)-043. Chicago, Ill. Part 1 and Part 2. Standard Metropolitan Statistical Area. May 72, 901p, PC-GPO$7.50, MF$1.45-NTIS

COM-71-80014-1B/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION AND HOUSING: 1970. PROCEDURAL HISTORY. ADVANCE ISSUANCE OF CHAPTERS 13 AND 14.
Jun 73, 51p CENSUS-70-PHC(R)-1B
Paper copy available from GPO $0.90 as C3.223:P94/2/970.

Descriptors: (*Census, United States), (*Populations, Census), (*Residential buildings, Statistical data), Data processing, Mapping, Coding, Connecticut.
Identifiers: *1970 Census of population and housing, Computer mapping.

The publication consists of two chapters that are portions of the forthcoming '1970 Census of Population and Housing: Procedural History'. The various chapters are being issued as they are completed and in advance of assembly in one final report. Chapter 13 of the report describes the Census Bureau's principal efforts to carry out research on small-area data and its applications, and to assist census users. It covers the development of the Census Use Study; describes the New Haven Use Study; reviews the development of the Dual Independent Map Encoding (DIME) System, Address Coding Guides (ACG), and the Geographic Base Files (GBF). A description of the Southern California Regional Information Study (SCRIS) and the organization of the Data Access and Use Laboratory is also given. Chapter 14 covers the 1970 Census Evaluation and Research Program, provides a brief background of the program, defines its objectives and concepts, and describes the various types of projects included in the program.

COM-71-80017-1A/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. SUBJECT REPORTS: NATIONAL ORIGIN AND LANGUAGE.
Jun 73, 540p CENSUS-70-PC(2)-1A
Paper copy available from GPO $5.05 as C3.233/10:970/1A.

Descriptors: (*Census, United States), (*Ethnic groups, Census), Tables(Data), Education, Employment, Income, Socioeconomic status, Languages.
Identifiers: National origin, Immigration, Citizenship.

The report provides statistics for the Unites States, regions, and selected standard metropolitan statistical areas (SMSA's) on the social and economic characteristics of immigrants and their children for selected countries of origin. The statistics are based on the 1970 Census of Population. Detailed tables in the report provide data on the native population of native parentage, native of foreign or mixed parentage, and the foreign stock population, cross-classified by one or more of the following: age; sex; race, nativity, parentage; relationship to head of household; marital status; fertility; residence in 1965; educational attainment; mother tongue; employment status and occupation; income in 1969 and class of worker; country of origin; year of immigration; country of birth; and citizenship.

COM-71-80017-1C/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. SUBJECT REPORTS: PERSONS OF SPANISH ORIGIN.
Jun 73, 236p CENSUS-70-PC(2)-1C
Paper copy available from GPO $2.85 as C3.223/10:970/1C.

Descriptors: (*Census, United States), (*Ethnic groups, Spanish language), Tables(Data), Education, Employment, Income, Residential buildings, Socioeconomic status.

The report presents statistics for persons of Spanish origin cross-classified by various social and economic characteristics. Data are shown for the United States, geographic regions, selected states, standard metropolitan statistical areas (SMSA's), and places. The data are based on the 1970 Census of Population. For the Spanish origin population, data are shown by type of origin cross-classified by sex and urban-rural residence; by race for the total Spanish origin population; and by such characteristics as age, race, household relationship, marital status, education, employment status, occupation, income in 1969, and housing. The report also includes information on the social, economic, and housing characteristics for 29 SMSA's with 50,000 or more persons of Spanish origin and for 31 places with 25,000 or more persons of Spanish origin. A summary of the data are included along with five appendixes which discuss general information concerning the data.

COM-71-80017-1D/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. SUBJECT REPORTS: PERSONS OF SPANISH SURNAME.
Jun 73, 156p CENSUS-70-PV(2)-1D
Paper copy available from GPO $2.35 as C3.223/10:970/1D.

Descriptors: (*Census, United States), (*Ethnic groups, Spanish language), Tables(Data), Employment, Income, Education, Houses, Socioeconomic status, Arizona, California, Colorado, New Mexico, Texas.

The report provides information on the various social, economic, and housing characteristics for persons of Spanish surname in five Southwestern States--Arizona, California, Colorado, New Mexico, and Texas; selected standard metropolitan statistical areas (SMSA's); and places within the five States, arranged by urban and rural residence. Data are based on the 1970 Census of Population. Data are cross-classified by one or more of the following: Age; sex; nativity, parentage, and country of origin; mother tongue; marital status; relationship to head of household; families by presence of children; children ever born; place of birth; educational attainment; residence in 1965; mean earnings in 1969; employment status; class of worker; income of persons in 1969; major occupation group; industry; workers in 1969 by weeks worked; housing characteristics (including rooms, persons, persons per room, units in structure, year structure built, selected equipment, automobiles available, value, and contract rent); and poverty status. Five appendixes in the report provide general information on the data; area classifications; definitions and explanations of subject characteristics; sources of error in the data; and information on the publication and computer summary tape program.

COM-71-80017-1F/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. SUBJECT REPORTS: AMERICAN INDIANS.
Jun 73, 235p CENSUS-70-PC(2)-1F
Paper copy available from GPO $2.60 as C3.223/10:970/1F.

Descriptors: (*Census, United States), (*Ethnic groups, Census), Tables(Data), Socioeconomic status, Education, Employment, Income, Houses.
Identifiers: *American Indians.

The report presents statistics on the American Indian population cross-classified by various social and economic characteristics. Slected housing characteristics are also given. Data are for the United States, regions, slected states, standard metropolitan statistical areas, Indian tribes, and identified reservations are given. The data are based on the 1970 Census of Population. The report also includes a list of American Indian tribal classification. Tables contain data on characteristics such as age, sex, family composition, marital status, school enrollment, employment status, poverty status, occupation, income in 1969, and housing (rooms, persons, persons per room, units in structure, year structure, year structure built, selected equipment, automobiles available, value, and contract rent). Additional tables show age and sex distribution for all reservations and tribal identification in the 1970 census, and present a cross-classification of mother tongue, age and sex for all Indians and for those living on identified reservations.

COM-71-80017-2B/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. SUBJECT REPORTS: MOBILITY FOR STATES AND THE NATION.
Jun 73, 460p CENSUS-70-PC(2)-2B
Paper copy available from GPO $4.55 as C3.233/10:970/2B.

Descriptors: (*Census, United States), (*Mobility, *Populations), Tables(Data), Socioeconomic status, Residential buildings, Education, Employment, Income, Population migrations.

The report presents data for the United States on geographic mobility of persons five years old and over during the period 1965 to 1970. The data were obtained from a question on residence on April 1, 1965 asked in the 1970 Census of Population and Housing. The statistics provide information on the general mobility of persons according to various social, economic, and housing characteristics. The tables most often divide residential mobility into moves within counties, between counties within a state, between contiguous states, and between noncontiguous states. Additional tables show area-to-area flows of various population subgroups with areas defined in terms of regions, divisions, or individual states, and immigrants and outmigrants for individual states. Data are cross-classified by one or more of the following: Age; sex; marital status; years of school completes; employment status; occupation; family income in 1969; and region of birth and residence in 1965. The report includes a summary of the data.

COM-71-80018-01/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION AND HOUSING: 1970. EVALUATION AND RESEARCH PROGRAM. THE QUALITY OF RESIDENTIAL GEOGRAPHIC CODING.
1973, 20p CENSUS-70-PHC(E)-01
Paper copy available from GPO $0.40 as C3.223/16:970/1.

Descriptors: (*Census, United States), (*Populations, Census), (*Residential buildings, Statistical data), Research, Coding, Evaluation, Tables(Data), Errors, Methodology.
Identifiers: *1970 Census of population and housing, Computer mapping, Block statistics.

The report is one of a series of reports resulting from the Evaluation and Research Program of the 1970 Census of Population. The data apply to housing units in areas of the United States for which block statistics are published. The report presents data on the accuracy of residential geographic coding in the 1970 census. Estimates have been obtained of the error rates for three levels of geographic coding: block; tract; and minor civil division, census county division, or place. The introduction gives a description of how geographic codes were assigned to housing units in the census. The text deals further with the methodology and results. Detailed tables show the various types of coding errors.

COM-71-80018-02/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.

CENSUS OF POPULATION AND HOUSING: 1970. EVALUATION AND RESEARCH PROGRAM. TEST OF BIRTH REGISTRATION COMPLETENESS 1964 TO 1968.
Mar 73, 14p CENSUS-70-PHC(E)-02
Paper copy available from GPO $0.20 as C3.223/16:970/2.

Descriptors: (*Census, United States), (*Populations, Census), (*Residential buildings, Statistical data), Birth, Research, Methodology, Estimates.
Identifiers: *1970 Census of population and housing, *Birth registrations.

The report presents estimates of the completeness of birth registration for the years 1964 to 1968. The report discusses the reasons for the tests and the previous tests of birth registration; the planning and methodology of the 1964 to 1968 tests; and the test results. The tables accompanying the text show national estimates of the completeness of birth registration in 1964 to 1968 by race and sex, and for the completeness of births in or out of hospitals. Comparative data from the 1940 and 1950 tests are also shown. A bibliography is included in the report along with two appendixes showing facsimiles of the forms used in the survey.

COM-71-80018-03/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION AND HOUSING: 1970. EVALUATION AND RESEARCH PROGRAM. RESULTS AND ANALYSIS OF THE EXPERIMENTAL MAIL EXTENSION TEST.
Jun 73, 31p CENSUS-70-PHC(E)-03
Paper copy available from GPO $0.60 as C3.223/16:970/3.

Descriptors: (*Census , United States), (*Populations, Census), (*Residential buildings, Statistical data), Houses, Methodology, Data processing, Evaluation, Research, Tables(Data).
Identifiers: *1970 Census of population and housing.

The report presents the results of an experimental test of mail out/mail back procedures in kinds of areas which were enumerated by the conventional list-enumerate methods in the 1970 census. Data from five areas originally designated for conventional enumeration, but converted to mail procedures, are compared with similar data from five conventionally enumerated areas paired with the test areas on a basis of population density. Mail and conventional census comparisons are made of completeness of housing unit enumeration, sample selection control, completeness of census questionnaires, costs, and coordination and control of operations.

COM-71-80021-08/GA PC-GPO/MF$1.45-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF HOUSING: 1970. SUBJECT REPORTS: COOPERATIVE AND CONDOMINUM HOUSING.
Jul 73, 337p CENSUS-70-HC(7)-08
Paper copy available from GPO $3.45 as C3.224/10:970/v7/)

Descriptors: (*Residential buildings, *Census), (*Socioeconomic status, Residential buildings), Tables(Data), Urban areas, Income, Demography, United States.
Identifiers: SMSA(Standard Metropolitan Statistical Areas), Standard metropolitan statistical areas, *Cooperative housing units, Condominium housing units.

The report from the 1970 Census of Housing presents data on owner-occupied cooperative and condominium housing units cross-classified by various housing and household characteristics. Data are shown for the United States, by inside and outside standard metropolitan statistical areas, and selected States and SMSA's. Detailed tables in the report show data by: Household composition, persons per room, income in 1969 of families and primary individuals, children under 18 years and persons 65 years old and over by income in 1969 of families and primary individuals, units in structure, and units in structure by year structure built. Three appendixes in the report provide information on area classifications, definitions and explanations of subject characteristics, and on the accuracy of the data.

COM-73-11678/2GA PC$3.00/MF$1.45
Office of Telecommunications, Boulder, Colo. Inst. for Telecommunication Sciences.
COMPUTER ACCESS TO GEOGRAPHIC DISTRIBUTION OF THE POPULATION.
Technical memo.,
Donald R. Ewing, and Judd A. Payne. Jul 73, 46p OTM-73-146

Descriptors: (*Populations, Statistical distributions), (*Graphic methods, *Computer programming), Mapping, Residential buildings, Statistical data, Computer programs, Demography.
Identifiers: Computer graphics, Medlist 3 computer program, COMPACT computer program, CHECK computer program, Areapop computer program, Popmap computer program, Statemap computer program.

A computer procedure is described which provides a map of population and/or housing units. Another procedure finds the population within arbitrary circles. The data base is the 1970 Master Enumeration District List, with coordinates, furnished by the U.S. Census Bureau. (Author)

COM-73-11679/0GA PC$3.00/MF$1.45
Chicago Univ., Ill. Center for Urban Studies.
NATIONAL GROWTH POLICY AND THE ENVIRONMENTAL EFFECTS OF CITIES.
Research rept.,
George S. Tolley. Apr 72, 50p* EDA/OER-73-016
Grant EDA-OER-393-G-71-12

Descriptors: (*Populations, *Industrial relations), (*Employment, *Travel), Regions, Urban areas, Environments, Cost analysis, Statistical distributions, Income, Policies, Reviews, Economic analysis, Growth, Highways, Pollution.
Identifiers: Population distribution, Population density.

A progress report is made on attempts to estimate the environmental effects of population distribution policies. The first section presents a framework. The framework is then used to estimate the change in national daily travel costs resulting from a policy of retarding growth of large cities. Attention is next given to urban density. Attention is called to the effects of road capacity dcisions and to the complexities of air pollution costs within a city. The closing section discusses the broader implication for national growth policy.

COM-73-11787/1GA Reprint
Wisconsin Univ., Green Bay. Regional Analysis Concentration.
WATER QUALITY PERCEPTION AND THE RECREATIONAL USES OF GREEN BAY, LAKE MICHIGAN,
Robert B. Ditton, and Thomas L. Goodale. 30 Dec 72, 12p WIS-SG-73-340 NOAA-73101003
Prepared in cooperation with Ottawa Univ. (Ontario). Dept. of Recreology. Revision of report dated 1 Aug 72.
Pub. in Water Resources Research, v9 n3 p569-579 Jun 73.

Descriptors: (*Green Bay, *Recreation), (*Water quality, Interviews), Lake Michigan, Perception, Fishing, Swimming, Boats, Water resources, Water pollution, Lakes, Statistical analysis, Public opinion.
Identifiers: Sea Grant program.

How people perceive Green Bay as a recreation resource, how perceptions differed between groups, and how these perceptions related to recreation use patterns, are identified. Whereas seven of 10 household heads interviewed participated in boating, or swimming, only three of the 10 used Green Bay during the preceding 12 months, indicating that Green Bay was not a focal point of water-based recreation among residents of the five-county study area. Chi square test groups differed significantly on most comparisons when used to describe the Bay and its most bothersome physical and water quality characteristics. Generally, participants and those who use the Bay were less apt to cite unpleasant smell and dead fish as major problems and more apt to cite such problems as winds, waves, and cloudiness. Comparisons between three user groups (fishermen, boaters, and swimmers) indicated swimmers and boaters differed most in their perception of the Bay and its troublesome characteristics, with fishermen occupying a position between to two groups. (Author)

N73-30915/5GA PC$11.50/MF$1.45
Drexel Univ., Philadelphia, Pa.
INTERVENTION INTO A TURBULENT URBAN SITUATION: A CASE STUDY.
Ph.D. Thesis.
G. M. Caldwell, Jr.. Jun 73, 187p NASA-CR-133830
Contract NGL-39-004-020

Descriptors: *Management methods, *Nasa programs, *Technology utilization, *Violence, Communities, Management planning, Problem solving, Social factors.

For abstract, see STAR 1121

PB-224 204/8GA PC$5.50/MF$1.45
National Conference of State Criminal Justice Planning Administrators, Frankfort, Ky.
STATE OF THE STATES ON CRIME AND JUSTICE. AN ANALYSIS OF STATE ADMINISTRATION OF THE SAFE STREETS ACT.
1 Jun 73, 224p*
Grant LEAA-73-TA-99-0009

Descriptors: (*Law enforcement, Evaluation), (*Crimes, Prevention), Law(Jurisprudence), Reviews, State government, Evaluation, Criminal law.
Identifiers: Criminal justice, Street crime, *Omnibus crime control and safe streets act.

The Development of State Planning Agency capabilities is traced with reference to overall planning, grant administration and monitoring, and audit and evaluation. The report provides a perspective on the early controversy which surrounded the passage of the Safe Streets Act in 1968. National totals for awards and disbursements are presented for the four fiscal years of the program and state by state breakdowns of funds expended on block grants, consultant services, and hardware items are presented in the appendix. Also included in the appendix is a directory of members of the National Conference of State Criminal Justice Planning Administrators. The volume concludes with a presentation of State Progress Reports for the 55 participating state planning agencies. (Modified author abstract)

PB-224 272/5GA PC$3.50/MF$1.45
Nebraska Univ., Omaha. Dept. of Criminal Justice.
THE PILOT CITY EXPERIENCE IN OMAHA-DOUGLAS COUNTY, NEBRASKA.
Interim rept.,
Malcolm E. MacDonald. Sep 72, 61p*
Contract LEAA-NI-72-004-G

Descriptors: (*Law enforcement, Evaluation), Police, Project planning, Objectives, Local government, Criminal law, Criminology, Policies, Nebraska.

Identifiers: Omaha County(Nebraska), Douglas County(Nebraska), Courts of law, *Criminal justice, Pilot cities program.

Omaha's criminal justice center used a research team of professionals for a sustained process of research, new program development, demonstration, and evaluation. The major thrust of the program was the development of system-wide improvements in the criminal justice system--police, courts, and corrections. The report covers the purpose of the center, its history and background, its organization, functions, and relationship to other organizations, progress to date on the originally stated goals, development of baseline data, and development and description of projects. (Modified author abstract)

PB-224 280/8GA PC$3.50/MF$1.45
New Mexico Univ., Albuquerque. Criminal Justice Program.
ALBUQUERQUE/BERNALILLO COUNTY YOUTH-RELATED PROPERTY CRIME REDUCTION PROGRAM: EVALUATION DESIGN,
J. Kent Butler. 5 Jun 73, 66p* CJP-73-2
Grants LEAA-72-DF-06-0049, LEAA-73-NI-06-0002

Descriptors: (*Juvenile delinquency, *Pattern recognition), (*Criminology, *Youths), (*Crimes, Prevention), Research, Projects, Police, Schools, Cooperation, Identifying, Predictions, New Mexico.
Identifiers: Truancy, High school students. Albuquerque(New Mexico), Crime potential, Bernalillo County(New Mexico).

The reported research project is designed to test the hypothesis that combined school-police action aimed at early identification of the subset of juveniles with a high crime potential, followed by remedial intervention, will result in a reduction of property crimes. The organization and operation of school-police teams is described in detail. An adaptive remedial intervention program is outlined for chronic truants, nonserious offenders, and initial serious offenders. Included in each intervention program is a list of action alternatives that may be utilized by the school-police teams. The evaluation design to be utilized and the appropriate hypotheses to be tested are presented. A detailed program schedule is provided and discussed. (Modified author abstract)

PB-224 393/9GA PC$5.75/MF$1.45
South Carolina Dept. of Corrections, Columbia.
THE EMERGING RIGHTS OF THE CONFINED.
Final rept.,
W. S. McAninch, and E. D. Wedlock, Jr. Jun 72, 246p* LEAA-NI-70-048
Grant LEAA-NI-70-048

Descriptors: (*Prisoners, *Legislation), (*Criminal law, *Information systems), Communicating, Mail, Regulations, Professional personnel, Religions, Mass media, Rehabilitation, Punishment(Psychology), Isolation, Safety, Medical services, Facilities, Employment, Transferring.
Identifiers: *Prison administration, *Court decisions, Discipline, *Prisoners rights, *Constitutional rights, Parole systems, Grievances, Visitation.

The report is intended to bring corrections officials up to date on recent court decisions in the area of the rights of confined prisoners. It systematically identified and analyzed the practical implications of recent decisions in the corrections area handed down by State Supreme Courts, Federal District Courts and the U.S. Supreme Court. The decisions are grouped by topic and explained in non-technical terms. Among the topics considered are: Correspondence and visitation; exercise of religion; discipline; inmate safety; and medical treatment.

PB-224 465/5GA PC$6.75/MF$1.45
National Park Service, Denver, Colo. Historic Preservation Team.
HISTORICAL BASE MAP, SHILOH NATIONAL MILITARY PARK AND CEMETERY, SHILOH, TENNESSEE.
Basic data study,
Edwin C. Bearss. Aug 73, 91p FNP-PHH-73-140

Descriptors: (*National parks, *History), Topography, Resources, Reviews, Management, Tennessee.
Identifiers: Shiloh National Military Park, Shiloh(Tennessee).

The study relates to efforts by the National Park Service to maintain the historic scene at Shiloh National Military Park. These efforts are to prevent changes of growth patterns of recent years from altering the character of fields to the point they have no relation to the historic period. The objective is to show these fields with their correct configuration and acreage. The study relates as well to the roads, fences, woods, etc. With such information as is presented here it is hoped the Service will be in a better position to manage the resources at the Park and restore the vegetative cover, where practicable to its appearance at the time of the battle. The report is documented, includes a bibliography, and a historical base map of the Park.

PB-224 485/3GA PC$4.85/MF$1.45
Maryland Univ., College Park. Inst. of Criminal Justice and Criminology.
THE CHANGE PROCESS IN CRIMINAL JUSTICE.
Jun 73, 195p* J-LEAA-021-72-C
Contract LEAA-J-LEAA-021-72
Presented at the National Symposium on Law Enforcement Science and Technology (4th) held at Maryland Univ. on 1-3 May 72.
Paper copy also available from GPO $2.35 as stock no. 2700-00191.

Descriptors: (*Law enforcement, *Revisions), Meetings, Prototypes, Behavior, Crimes, Interactions, Barriers.
Identifiers: *Criminal justice, Pilot cities program.

The process of criminal justice change is analyzed and discussed in this monograph, with emphasis on the interchange between operating agency heads or public officials and research organizations and other groups attempting to act as change agents. The collection of papers includes discussions of efforts of the Law Enforcement Assistance Administration to introduce systematic change into the criminal justice system by means of the Pilot and Impact Cities programs. The development, goals and problems encountered in these programs are delineated. Two authors describe the obstacles to change brought about by the influence of interorganizational as well as interpersonal relationships. Also included are the symposium plenary addresses bhich summarize recent criminal justice achievements and suggest future directions of effort to expand and continue the achievement pattern.

PB-224 487/9GA PC$5.10/MF$1.45
Maryland Univ., College Park. Inst. of Criminal Justice and Criminology.
NEW APPROACHES TO DIVERSION AND TREATMENT OF JUVENILE OFFENDERS.
Jun 73, 209p* J-LEAA-021-72-G
Contract LEAA-J-LEAA-021-72
Presented at the National Symposium on Law Enforcement Science and Technology (4th) held at Maryland Univ. on 1-3 May 72.
Paper copy also available from GPO $2.60 as stock no. 2700-00190.

Descriptors: (*Juvenile delinquency, *Treatment), (*Youths, *Rehabilitation), Diverting, Meetings, Criminology.
Identifiers: Criminal justice, Community based treatment.

This monograph covers a variety of approaches in the handling of juvenile offenders. Individual papers analyze recent innovations in juvenile community-based corrections in addition to programs and proposals aimed at diverting the juvenile from the criminal justice system. Papers on diversion include an outline of the Youth Development and Delinquency Prevention Administration's national program to establish community youth services systems, a lawyer's view of diversion programs, and new directions in diverting offenders to human development and treatment programs. Use of the workshop-conference as a device for developing juvenile justice programs is also discussed, as well as experimental treatment projects as a change model for corrections. There are also papers on community-based treatment for juveniles in Massachusetts, the community role in juvenile delinquency programs, and the use of youth leaders to supervise juvenile offenders awaiting trial.

PB-224 488/7GA PC$4.60/MF$1.45
Maryland Univ., College Park. Inst. of Criminal Justice and Criminology.
REDUCING COURT DELAY.
Jun 73, 124p J-LEAA-021-72-F
Contract LEAA-J-LEAA-021-72
Presented at the National Symposium on Law Enforcement Science and Technology (4th) held at Maryland Univ. on 1-3 May 72.
Paper copy also available from GPO $2.10 as stock no. 2700-00195.

Descriptors: (*Criminology, Revisions), (*Delay time, Reduction), Management, Problem solving, Research, Opinions, Recommendations, Simulation, Utilization.
Identifiers: *Court delays, Simulation models, Court reform, Juror utilization, Witness management.

Following one of the major recommendations of the Science and Technology Task Force Report of the President's Crime Commission (1967), numerous studies have been conducted to assess alternative means to reduce court delay. The monograph presents some of the results of that research, and discusses the emerging problems that have been identified as attempts have been made to reduce delay. In particular, case scheduling, the handling of witnesses and jurors, and the effectiveness of alternative administrative strategies are discussed.

PB-224 490/3GA PC$2.85/MF$1.45
Maryland Univ., College Park. Inst. of Criminal Justice and Criminology.
REINTEGRATION OF THE OFFENDER INTO THE COMMUNITY.
Jun 73, 61p* J-LEAA-021-72-D
Contract LEAA-J-LEAA-021-72
Presented at the National Symposium on Law Enforcement Science and Technology (4th) held at Maryland Univ. on 1-3 May 72.
Paper copy also available from GPO $0.85 as stock no. 2700-00192.

Descriptors: (*Criminology, *Rehabilitation), (*Community relations, Criminal psychology), Social psychology, Incentives(Psychology), Behavior, Adjustment(Psychology), Public opinion, Problem solving, Project planning, Recommendations.
Identifiers: *Offender reintegration, *Parolees, Probation.

The monograph assesses various solutions to the problem of the offender returning to society. Theories relating to the rehabilitation and reintegration of offenders are discussed, and it is suggested that, rather than emphasizing punishment as a means of control, economic and social incentives might be more effectively utilized. The results of a study which delineated a probationer and parolee typology based on family interaction patterns are reported. Treatment schemes for the various types of offenders are outlined. Problems

encountered by parolees on their return to society are examined, including the abandonment of old habits and the acquisiton of new, socially adaptive habits. Several suggestions are made for coordinating reintegration activities of the prisons.

PB-224 524/9GA PC$4.60/MF$1.45
Maryland Univ., College Park. Inst. of Criminal Justice and Criminology.
DETERRENCE OF CRIME IN AND AROUND RESIDENCES,
Janelle Blanchard, William H. Brill, Gordon E. Misner, Oscar Newman, and Wilbur Rykert. Jun 73, 133p* J-LEAA-021-72-B
Contract LEAA-J-LEAA-021-72
Paper copy also available from GPO $2.10 as J1-37:R31.

Descriptors: (*Law enforcement, Urban areas), (*Crimes, *Residential buildings), Reduction, Security, Legislation, Building codes, Law(Jurisprudence), Sociology, Police, Criminology, Architecture.
Identifiers: Criminal justice.

The physical structuring of residences as a means of deterring criminal activity is discussed in several contexts including the overall impacts of architectural design on criminal activity and the value of legislating building security codes as a deterrence factor. The need for community involvement in programs to curb crime is highlighted as a major element of the overall problem. Actions which can be taken by the individual, by community groups, and by joint citizen-police cooperative efforts are covered. Also presented is a paper analyzing the patterns of residential and non-residential burglaries which result from the interaction of the offender who takes advantage of existing opportunities or creates his own opportunities to commit crimes; the citizen who increases or decreases the probability that he will or will not become a victim of a particular crime; and the police who attempt to counter the moves of the offender and support the moves of the citizen.

PB-224 539/7GA PC$4.85/MF$1.45
Maryland Univ., College Park. Inst. of Criminal Justice and Criminology.
INNOVATION IN LAW ENFORCEMENT.
Jun 73, 172p* J-LEAA-021-72-E
Contract LEAA-J-LEAA-021-72
Paper copy also available from GPO $2.35 as stock no. 2700-00194.

Descriptors: (*Law enforcement, *Urban areas), (*Police, Revisions), Cooperation, Services, Scheduling, Personnel development, Cost effectiveness, Planning, Evaluation, Management, Effectiveness.
Identifiers: Criminal justice.

The topics discussed consider obstacles to the adoption of new technology and strategies for changing urban police policies, concepts, and functions. Papers presented in this publication include 'Demonstration Projects As a Strategy for Change', 'Political Factors Affecting Public Safety Communications Consolidation', and problems encountered when 'Changing the Rhetoric of Professionalism'. Additional material concerns scheduling police manpower by computer, and the four-day, forty-hour work week.

PB-224 542/1GA PC$2.95/MF$1.45
Maryland Univ., College Park. Inst. of Criminal Justice and Criminology.
CRIMINAL JUSTICE MONOGRAPH. PREVENTION OF VIOLENCE IN CORRECTIONAL INSTITUTIONS ,
Jack E. Brent, Walter Dunbar, Edith E. Flynn, Barton L. Ingraham, and William D. Leeke. Jun 73, 74p* J-LEAA-021-72-A
Contract LEAA-J-LEAA-021-72
Paper copy also available from GPO $0.95 as stock no. 2700-00193.

Descriptors: (*Prisoners, Insurgency), (*Criminology, *Social reforms), Law enforcement, Organizations, Stress(Psychology), Interpersonal relations, Conflict, Social psychology, Recommendations, Reviews.
Identifiers: *Prison riots, Grievances, Prisoners rights.

The monograph describes and analyzes conditions that lead to collective disorders in correctional facilities and suggests potential ways of alleviating those conditions. The development of tension management and organizational activism by correctional managers is suggested as preventives of disorders. The factors contributing to the Attica tragedy are analyzed and recommendations are offered for preventing similar occurrences. Behavioral science theory and empirical data on prison riots are used to examine sources of collective violence in correctional institutions. The provision of legal remedies to resolve inmate grievances is criticized as a potential means of precluding violence.

PB-224 551/2GA PC$2.85/MF$1.45
Operations Research Inc., Silver Spring, Md.
CRIMINAL JUSTICE MONOGRAPH. NATIONAL ADVISORY COMMISSION ON CRIMINAL JUSTICE STANDARDS AN GOALS, MAY 1972.
Progress rept.
Jun 73, 61p* J-LEAA-021-72-1
Contract LEAA-J-LEAA-021-72
Paper copy also available from GPO $0.85 as stock no. 2700-00189.

Descriptors: (*Crimes, Prevention), (*Standards, Police), (*Police, Objectives), (*Law enforcement, Standards), (*Criminology, Objectives), Reduction.
Identifiers: *Criminal justice.

This monograph contains a series of six month progress reports from the commission established to develop national goals, performance standards, and priorities for reducing crime. The progress reports are from the commission's four operational task forces on standards and goals for police, the courts, corrections, and community crime prevention. (Author)

PB-224 554/6GA PC$3.00/MF$1.45
Maryland Univ., College Park. Inst. of Criminal Justice and Criminology.
CRIMINAL JUSTICE MONOGRAPH. RESEARCH ON STREET CRIME CONTROL.
Jun 73, 84p* J-LEAA-021-72-H
Contract LEAA-J-LEAA-021-72
Paper copy also available from GPO 1.00 as stock no. 2700-00201.

Descriptors: (*Crimes, Prevention), (*Closed circuit television, *Surveillance), Treatment, Meetings, Police, Drug addiction, Television reconnaissance, Recommendations.
Identifiers: Criminal justice, Street crime.

The potential and reality of research on the effectiveness of various police strategies to control street crime are discussed in this monograph. In general, the papers consider the methodological problems of research on street crime control, the results of recently completed and ongoing research, and the future of research in this area. Two of the papers cover specific equipment to aid in crime control--'Low Light Level Television Equipped Patrol Vehicles for Use in Urban Areas' and 'A Cost Effectiveness Model for Designing Closed Circuit Television Surveillance Systems'. The others discuss broader topics--'The Control of Street Robbery: Some Strategic Considerations', 'Problems in the Evaluation of Manpower Effectiveness', and 'Treatment Alternatives to Street Crime (TASC)'.

PB-224 562/9GA PC$3.00/MF$1.45
New Mexico Univ., Albuquerque. Criminal Justice Program.
THE SOUTHWEST VALLEY YOUTH DEVELOPMENT PROGRAM.
Evaluation rept.,
Stephen F. Blake. 8 Dec 72, 12p CJP-72-7
Contract LEAA-NI-71-050

Descriptors: (*Juvenile delinquency, Prevention), New Mexico, Spanish Americans, Services, Evaluation, Counseling, Recreation, Recommendations.
Identifiers: *Youth programs, Albuquerque(New Mexico).

The goal of delinquency prevention in a New Mexico community was to be achieved by a project's becoming a youth service bureau (making referrals to other, already existing agencies) and by providing services that were not being provided, such as job placement, drug counseling and recreational programs. The project was a success if measured by agency, community and client acceptance. How successful the project was with individual clients has not been determined. The evaluators recommend continued governmental support of the project. (Modified author abstract)

PB-224 567/8GA PC$3.00/MF$1.45
New Mexico Univ., Albuquerque. Criminal Justice Program.
ALBUQUERQUE/BERNALILLO COUNTY PILOT CITIES PROGRAMS. SUMMARY OF PHASE I ACCOMPLISHMENTS.
Working paper,
W. R. Partridge. 23 Jan 73, 12p CJP-WP-73-1

Descriptors: (*Criminology, *Urban areas), (*Law enforcement, Projects), Police, Drug addiction, Crimes, Public relations, New Mexico, Project planning, Cooperation, Systems analysis.
Identifiers: *Pilot cities program, Albuquerque(New Mexico), Bernalillo County(New Mexico), Criminal justice.

The projects listed were in the field of law enforcement and included improvement in police efficiency and in the equality of justice. Other accomplishments were in the areas of public understanding of the potential for heroin treatment in the reduction of crime, community cooperation in crime prevention and agency responsiveness to community needs, agency management and planning capability, and public awareness of adjudication, corrections and rehabilitation needs. (Modified author abstract)

PB-224 576/9GA PC$3.75/MF$1.45
American Justice Inst., Sacramento, Calif.
SANTA CLARA CRIMINAL JUSTICE PILOT PROGRAM. RESEARCH IN PROGRESS, JULY 1973.
Jul 73, 84p* LEAA-NI-72-09-0001
Grant LEAA-NI-09-0001
Prepared by National Institute of Law Enforcement and Criminal Justice, Wash., D.C.

Descriptors: (*Law enforcement, *California), Projects, Evaluation, Prototypes.
Identifiers: *Santa Clara(California), *Criminal justice, Pilot cities program.

Description of each of the pilot research and demonstration projects are included as a summary of the findings and reports evolving from the project. The projects are divided into two groups: the pilot research projects conducted by the Santa Clara Criminal Justice Pilot Program and demonstration projects developed to attract state block funds or LEAA discretionary funds. Citations are provided to the appropriate publications for the research projects that have been completed, and for demonstration projects that have completed at least one year. Whereever available, a summary of the evaluation follows the summary description of the project. (Modified author abstract)

PB-224 599/1GA PC$3.25/MF$1.45
New Mexico Univ., Albuquerque. Criminal Justice Program.

THE IMPACT OF THE ARGERSINGER DECISION: PROVIDING COUNSEL FOR INDIGENT MISDEMEANANTS,
Stephen F. Blake. 27 Nov 72, 25p CJP-72-5
Contract LEAA-NI-71-050-G

Descriptors: (*Criminology, *Policies), (*Criminal law, *Professional personnel), Litigation, New Mexico.
Identifiers: Misdemeanants, *Criminal courts, Lawyers, Trials(Law), Argersinger vs Hamlin.

The possible effects of the Argersinger V. Hamlin ruling on the resources of the New Mexico district, magistrate, and municipal courts are presented. Suggested measures for providing counsel for indigent misdemeanant defendants are described. Measures that could be implemented to lessen the impact on the court system are presented, including waiving the right to counsel, establishing stricter standards for determining indigency, and providing penalties other them imprisonment. (Modified author abstract)

PB-224 621/3GA PC$2.95/MF$1.45
Operations Research, Inc., Silver Spring, Md.
PREVENTION AND CONTROL OF COLLECTIVE VIOLENCE. VOLUME I. GUIDELINES FOR THE CHIEF OF POLICE.
W. Thomas Callahan, and Richard L. Knoblauch.
Jun 73, 77p* LEAA-NI-71-097-G-A
Grant LEAA-NI-71-097-G
Paper copy also available in set of 5 reports as PB-224 620-Set, PC$9.00; single copy also available from GPO $0.95 as stock no. 2700-00197.

Descriptors: (*Crimes, Prevention), (*Police, Education), (*Law enforcement, Instructions), Evaluation, Control, Project planning, Predictions, Criminal psychology, Manuals, Social psychology, Criminology.
Identifiers: *Collective violence, Riots.

The report includes guidelines on the collection and dissemination of the essential information required for decision making before and during an episode of collective violence. The introductory chapter explains guideline basic propositions, the methods of preparation, and the specific information needed for the prevention and control of violence. Individual chapters cover the activities of planning, training, operations, and evaluation as they relate to the police chief's needs. Within each chapter, prevention and control guidelines are listed separately and futher broken into categories based upon six essential intelligence elements: the locations of collective violence, the reasons for outbreaks, time considerations, persons involved, types of events, and the ways in which collective violence occurs.

PB-224 622/1GA PC$2.85/MF$1.45
Operations Research, Inc., Silver Spring, Md.
PREVENTION AND CONTROL OF COLLECTIVE VIOLENCE. VOLUME II UIDELINES FOR COMMUNITY RELATIONS PERSONNEL.
W. Thomas Callahan, and Richard L. Knoblauch.
Jun 73, 57p* LEAA-NI-71-097-G-B
Grant LEAA-NI-71-097-G
Paper copy also available in set of 5 reports as PB-224 620-Set, PC$9.00; single copy also available from GPO $0.85 as stock no 2700-00198.

Descriptors: (*Crimes, Prevention), (*Police, *Community relations), (*Law enforcement, Instructions), Evaluation, Control, Project planning, Predictions, Criminal psychology, Manuals, Social change.
Identifiers: *Collective violence, Riots.

Guidelines are presented for the maximum use by community relations officers of their potential for discovering and easing tensions in the community. Community relations personnel are in an unusually advantageous position to aid in the prevention and control of collective violence. Community police units are most effective in developing and participating in procedures for preventive action but can also be of limited help in the control stage. In the prevention phase, they can locate the potential sources of violence by familiarizing themselves with groups of dissidents and arranging meetings with group leaders to work out grievances. Suggestions are provided dealing with dissidents, and when and where to hold the most productive meetings. Once possible dissidents have been located, the community police unit can plan activities relevant to their needs and interests. If these groups are planning demonstrations, police should guide them in the most effective way to maintain order.

PB-224 623/9GA PC$2.85/MF$1.45
Operations Research, Inc., Silver Spring, Md.
PREVENTION AND CONTROL OF COLLECTIVE VIOLENCE. VOLUME III. GUIDELINES FOR INTELLIGENCE PERSONNEL,
W. Thomas Callahan, and Richard L. Knoblauch.
Jun 73, 62p* LEAA-NI-71-097-G-C
Grant LEAA-NI-71-097-G
Paper copy also available in set of 5 reports as PB-224 620-Set, PC$9.00; single copy also available from GPO $0.85 as stock no. 2700-00199.

Descriptors: (*Intelligence, Personnel), (*Crimes, Prevention), (*Law enforcement, Instructions), (*Police, Education), Evaluation, Control, Project planning, Predictions, Criminal psychology, Manuals, Social psychology, Criminology.
Identifiers: *Collective violence, Riots.

The report presents duties of intelligence personnel in the task of collecting, verifying, processing, and disseminating information concerning collective violence. An introductory section discusses the need for, purpose of, and methods of preparation of these guidelines as well as information requirements for both the prevention and control of collective violence. Facets of planning and training personnel are outlined to ensure that 'information flows unimpeded through the rank structure and functional divisions and units'. The guidelines conclude with ways in which intelligence personnel can support the Chief of Police in conducting assessments of prevention and control actions. The following essential elements are emphasized in the sections on planning, training, operations and evaluation: reasons for collective violence, potential locations, time considerations, participants, types of disturbances, and ways in which collective violence occur.

PB-224 624/7GA PC$2.85/MF$1.45
Operations Research, Inc., Silver Spring, Md.
PREVENTION AND CONTROL OF COLLECTIVE VIOLENCE. VOLUME IV. GUIDELINES FOR THE PATROL COMANDER,
W. Thomas Callahan, and Richard L. Knoblauch.
Jun 73, 55p* LEAA-NI-71-097-G-D
Grant LEAA-NI-71-097-G
Paper copy also available in set of 5 reports as PB-224 620-Set, PC$9.00; single copy also available from GPO $0.85 as stock no. 2700-00200.

Descriptors: (*Crimes, Prevention), (*Police, Education), (*Law enforcement, Instructions), Evaluation, Control, Project planning, Predictions, Criminal psychology, Manuals, Social psychology, Criminology.
Identifiers: *Collective violence, Riots, Police patrols.

The monograph presents guidelines in the areas of planning, training, operations, and evaluation as applied to incidents of collective violence. Planning is divided into two categories--planning for prevention includes all the analyses and decisions necessary to prepare operations for reducing tension and interrupting potentially violent activities; planning for control is oriented toward preparing procedures for rapidly restoring order once violence has occurred. In the area of training, the report concentrates on the steps that the patrol commander should take to plan and provide training for preventive and control operations. The guidelines on operations for prevention cover the detection and reduction of tension and the forestalling of attempts to initiate violence. Operations for control include deployment, movement, and support of police officers to end violence.

PB-224 625/4GA PC$2.75/MF$1.45
Operations Research, Inc., Silver Spring, Md.
PREVENTION AND CONTROL OF COLLECTIVE VIOLENCE. VOLUME V. GUIDELINE FOR PATROL PERSONNEL.
W. Thomas Callahan, and Richard L. Knoblauch.
Jun 73, 47p* LEAA-NI-71-097-G-E
Grant LEAA-NI-71-097-G
Paper copy also available in set of 5 reports as PB-224 620-SET, PC$9.00; single copy also available from GPO $0.75 as stock no. 2700-00203.

Descriptors: (*Crimes, Prevention), (*Police, Education), (*Law enforcement, Instructions), Evaluation, Control, Project planning, Predictions, Criminal psychology, Manuals, Social psychology, Criminology.
Identifiers: *Collective violence, Riots, Police patrols.

The monograph presents patrolmen with practical guidelines for their contribution to the planning, training, operations, and evaluation activities of riot control. Each of these topics is discussed in relation to the following: reasons for collective violence, potential locations, time considerations, participants, types of disturbances, and ways in which collective violence occur. Viable relationships between patrol officers and other personnel engaged in the prevention and control of violent disturbances are stressed. Because of their firsthand acquaintance with the problems of dealing with collective violence, it is suggested that patrol personnel be encouraged to 'provide a positive input to police planning and training needs'. Similarly, means by which 'patrol officers can provide personal evaluations of training, equipment, and procedures which the department has adopted for prevention and control of collective violence', are outlined.

PB-224 629/6GA PC$6.00/MF$1.45
National Park Service, Denver, Colo. Historic Preservation Team.
HISTORIC STRUCTURES REPORT CASTOLON ARMY COMPOUND, BIG BEND NATIONAL PARK,
James Sheire, and Robert V. Simmonds. Jun 73, 80p FNP-PHH-73-144

Descriptors: (*National parks, *History), Sites, Military facilities, Architecture, Reviews, Texas.
Identifiers: *Big Bend National Historical Park, Camp Santa Helena, Panther Junction(Texas).

The report deals with Camp Santa Helena, which is the Castolon area of Big Bend National Park. The site was used by the United States Army. The structures of the camp site date from 1919. The purpose of the study is to furnish information needed to reach decisions as to the level of preservation treatment for what exists today. The structures existing today number six and are identified for what they represented. The report includes, in addition to an administrative data section, a historical data section. There are suggestions and recommendations by the author, an appendix presenting copy of the Mexican Border Project Completion Report, a bibliography, and illustrations.

PB-224 647/8GA PC$9.25/MF$1.45
Des Moines/Polk County Metropolitan Criminal Justice Center, Iowa.
THE CRIMINAL JUSTICE SYSTEM IN POLK COUNTY, IOWA. VOLUME 2. LAW ENFORCEMENT: DESCRIPTION AND ANALYSIS.
Interim rept.
Dec 72, 145p
Grant LEAA-NI-72-003-G
See also Volume 3, PB-224 689.

Descriptors: (*Criminal law, *Iowa), (*Law enforcement, *Management), Municipalities, Police, Communication equipment, Identification systems, Criminal investigations, Traffic regulations, Narcotics, Intelligence, Juvenile delinquency, Data processing, Problem solving, Information systems.
Identifiers: Polk County(Iowa), Support services, Vice control, Management information systems, *Criminal justice.

An analysis is presented in Volume 2 of a five volume report of law administration, technical support services, and juvenile activities in Polk County, Iowa, as well as uniform patrol functions, criminal investigation, traffic enforcement, and vice control. The section on baseline data evaluation deals with patterns and trends in law enforcement, problem areas and recommendations. Appended material includes statistical charts and a sample data collection questionnaire for each jurisdiction. Volume 1 has not been published.

PB-224 651/0GA PC$9.25/MF$1.45
Buffalo City Dept. of Community Development, N.Y. Div. of Programming.
CITY OF BUFFALO STUDY OF SOCIAL PROGRAMS.
Final rept.
Aug 73, 143p CBNY-63073-1
Prepared by Cresap, McCormick and Paget, Inc.

Descriptors: (*Social welfare, *Services), (*Social organization, *New York), Organizations, Urban areas, Management methods, Reviews, Objectives, Operations, Project planning, Classifications, Community relations, Recommendations.
Identifiers: Buffalo(New York).

The report documents the findings of an analytical review of functions and program operations of all city of Buffalo, New York, agencies providing human services programs, as well as major county and private sector agencies concerned with social services. The results of this activity serve as a basis for identifying resources in the city which can assist the city administration in making policy decisions involving human service programs and designing a recommended structure which allows for a more effective delivery of social services.

PB-224 679/1GA PC$13.25/MF$1.45
Des Moines/Polk County Metropolitan Criminal Justice Center, Iowa.
THE CRIMINAL JUSTICE SYSTEM IN POLK COUNTY, IOWA. VOLUME 4. JUVENILE JUSTICE: DESCRIPTION AND ANALYSIS.
Interim rept.
Jan 73, 222p
Grant LEAA-NI-72-003-G
See also Volume 3, PB-224 689 and Volume 2, PB-224 647.

Descriptors: (*Criminal law, *Iowa), (*Juvenile delinquency, Law(Jurisprudence)), Organizations, Constraining, Facilities, Reviews, Systems analysis, Schools, Data processing, Methodology, Improvement, Recommendations.
Identifiers: *Criminal justice, Polk County(Iowa), Parole systems, *Juvenile courts, Confinement(Psychology), Juvenile detention.

The report, Volume 4 in a five volume series on criminal justice analyzes the agencies handling juvenile adjudication and probation, short-term juvenile detention, community-based treatment, institutional confinement, and juvenile parole. It includes analysis of data gathered in phase 1 of the Metropolitan Criminal Justice Center's baseline data collection. Detailed recommendations are included for the juvenile justice system as a whole, the Polk County Juvenile Court, the Polk County Juvenile Detention Center, and the Iowa State Training Schools. (Modified author abstract)

PB-224 689/0GA PC$6.25/MF$1.45
Des Moines/Polk County Metropolitan Criminal Justice Center, Iowa.
THE CRIMINAL JUSTICE SYSTEM IN POLK COUNTY, IOWA. VOLUME 3. ADJUDICATION: DESCRIPTION AND ANALYSIS.
Interim rept.
Dec 72, 84p
Grant LEAA-NI-72-003-G
See also volume 2, PB-224 647 and Volume 4, PB-224 679.

Descriptors: (*Criminal law, *Iowa), (*Criminology, Systems), Interrogation, Police, Professional personnel, Methodology, Organizations, Systems analysis, Data processing, Management.
Identifiers: Trials(Law), Courts of law, Court procedures, Polk County(Iowa), *Criminal justice, Defense counsels, Arrest and booking procedures, Prosecution.

The report deals with such aspects of the Polk County, Iowa, criminal justice system as arrest and interrogation, preliminary examination, and criminal procedure. It examines the court system, prosecution, and defense counsel, and presents recommendations for improvement. Appended material includes data on budgets, salary allocations, expenditures, and case disposition. Also included are court and judicial research questionnaires.

PB-224 746/8GA PC$3.00/MF$1.45
American Justice Inst., Sacramento, Calif.
SANTA CLARA CRIMINAL JUSTICE PILOT PROGRAM. PUBLICATIONS LIST (ANNOTATED), REVISED EDITION.
Feb 73, 28p* LEAA-NI-72-09-0001-E
Grant LEAA-NI-72-09-0001
See also PB-211 093. Revision of report dated May 72.

Descriptors: (*Criminology, *Bibliographies), (*Law enforcement, *California), (*Crimes, Reduction), Projects, Reporting, Computer programming, Data processing, Methodology, Juvenile delinquency, Pattern recognition, Classifications, Records, Police, Attitudes.
Identifiers: Criminal justice, Demonstration programs, *Santa Clara County(California), Victim reports, Prison term characteristics, San Jose(California), Juvenile detention, Peace officers.

Documents described are pilot program research reports and progress reports, demonstratian grant applications, demonstration project final reports and journal articles. The Santa Clara Criminal Justice Pilot Program has produced this annotated bibliography to promote technology transfer and to disseminate the results and content of Pilot Program activities. An appendix gives information about obtaining the publications listed. (Modified author abstract)

PB-224 773/2GA PC$6.25/MF41.45
California Univ., Berkeley. Dept. of Economics.
THE EFFECT OF HOUSING SEGREGATION ON THE NEGRO JOURNEY TO WORK.
Final rept.,
William George Moss. Apr 73, 275p DLMA-91-06-71-09-1
Contract DL-91-06-71-09
Doctoral thesis.

Descriptors: (*Social welfare, *Central city), (*Negroes, *Industrial relations), (*Travel, Employment), Reviews, Mathematical models, Socioeconomic status, Urban areas, Separation, Residential buildings, Populations, Econometrics, California.
Identifiers: Housing segregation, San Francisco(California).

The purpose of the study is to determine the effect of housing discrimination and the resulting segregation in the San Francisco Bay Area on Negro welfare through its effect on Negro journeys to work. A consistent model of consumer behavior is developed to explain the head of the household's journey to work in terms of the household's space preferences. The determinants of housing preferences are the social and economic characteristics of the household. In this model households trade off transportation costs for housing cost saving.

PB-224 794/8GA PC$3.50/MF$1.45
Vera Inst. of Justice, New York.
THE MANHATTAN COURT EMPLOYMENT PROJECT OF THE VERA INSTITUTE OF JUSTICE.
Final rept. Nov 67-31 Dec 70,
Ennis J. Olgiati. 1972, 69p* DLMA-82-34-68-09-2
Contract DL-82-34-68-09

Descriptors: (*Criminology, Experimental design), (*Vocational guidance, *Personnel development), (*Behavior, *Psychological guidance), Employment, Projects, Social psychology, Counseling, Upgrading, Rehabilitation.
Identifiers: *Prosecution cancellation.

In 1967, a project was set up to test whether a successful job coupled with counseling could change certain defendants' life-styles within a three-month period after arrest, before trials were held. Working closely with the New York City courts, the District Attorney's office, and employers sympathetic to the idea of rehabilitation, the project obtained 90 day trial delays. During this period, project career developers found jobs for participants while counselors, themselves ex-offenders and ex-addicts, provided backup support. If defendants did well during the period, the project recommended that their cases be dismissed. Results of the experiment are reports.

PB-224 796/3GA PC$7.00/MF$1.45
New Mexico Univ., Albuquerque. Criminal Justice Program.
POLICE/COMMUNITY COOPERATION AND UNDERSTANDING EVALUATION PROJECT. VOLUME I. SURVEY FINDINGS.
Final rept.,
S. S. Wilson. 31 Aug 72, 314p* CJP-72-2-A
Contract LEAA-70-DF-311
Paper copy available from NTIS $10.00/set of 2 reports as PB-224 795-SET.

Descriptors: (*Police, *Community relations), (*Law enforcement, *Attitudes), (*Sociopsychological surveys, *New Mexico), Public opinion, Factor analysis, Interviews, Questionnaires, Social psychology, Chcanos, Youths, Socioeconomic status, Caucasians, Pattern recognition, Officer personnel, Statistical analysis.
Identifiers: Understanding, *Albuquerque(New Mexico).

Objectives of the study, reported on in two volumes, were to discover citizen attitudes toward police, police attitudes toward citizens, and the strength and causative factors associated with these attitudes. A further objective was the definition of specific programs to improve negative attitudes and reinforce positive attitudes. Citizens, representing a cross-section of the community, were interviewed, and all officers of the police force were surveyed by the questionnaire approach. No elaborate statistical treatment of the data was attempted. Volume 1 discusses the major findings.

PB-224 797/1GA PC$4.50/MF$1.45
New Mexico Univ., Albuquerque. Criminal Justice Program.
POLICE/COMMUNITY COOPERATION AND UNDERSTANDING EVALUATION PROJECT. VOLUME II: RECOMMENDATIONS.
Final rept.,
W. R. Partidge, Fred W. Koehne, Catherine A. Goldberg, and Stephany S. Wilson. 7 Nov 72, 140p* CJP-72-2-B
Grant LEAA-70-DF-311

Paper copy also available from NTIS $10.00/set of 2 reports as PB-224 795-SET.

Descriptors: (*Police, *Community relations), (*Public opinion, Police), (*Law enforcement, *New Mexico), Evaluation, Project planning, Human behavior, Attitudes, Policies, Sociopsychological surveys, Morale, Public relations, Specialized training, Communicating, Recommendations.
Identifiers: Civil disorder handling, Albuquerque(New Mexico). Police citizen contacts.

The implications of attitude survey findings are reported for future implementation of police policies, and community relations efforts. Volume 2 of a two-volume report explains the reasoning process which led to the specific programs recommended and includes an overview of the current status of police community relations in Albuquerque. A series of suggestions to counter future threats to personal safety, improve citizen satisfaction with police, and improve morale of police officers include abandoning image-building programs in favor of programs that increase contact of street officers with citizens and upgrading police training in handling demonstrations and riots.

PB-224 832/6GA PC$4.25/MF$1.45
Idaho Univ., Moscow. Water Resources Research Inst.
WILD RIVER PERCEPTION AND MANAGEMENT: A STUDY OF USERS AND MANAGERS OF THE MIDDLE FORK OF THE SALMON RIVER.
Scenic Rivers Study rept. no. 8,
Robert Larry Peckfelder. Jun 73, 122p W74-00551, OWRR-C-3342(3718)(2)

Descriptors: (*Recreation, *Floating), (*Water resources, Management planning), (*Salmon River, Utilization), Idaho, Questionnaires, Public opinion, Rivers, Traffic, Attitude surveys, Attitudes, Theses.
Identifiers: Scenic rivers, Floaters, Wild rivers.

Mail questionnaires provided data from 253 Middle Fork floaters and 21 Forest Service personnel familiar with Middle Fork management. Comparison of group attitudes indicates that Middle Fork managers and users tended to view features, preferences, problems, and benefits about the same. In their personal outlook on river management, the Forest Service was very much in tune with river users. Forest Service personnel were able to correctly predict Middle Fork floater reactions to more than three-fourths of the questionnaire statements presented in this study.

PB-224 886/2GA PC$3.50/MF$1.45
Atlanta City Planning Dept., Ga.
WHO WILL LIVE IN ATLANTA IN 1980.
Aug 73, 28p

Descriptors: (*Demography, *Georgia), (*Populations, Mathematical prediction), Municipalities, Age, Ethnic groups, Sex, Population migrations, Statistical distributions, Birth.
Identifiers: *Atlanta(Georgia).

The population of the city of Atlanta in 1980 is projected by age, race, and sex. The cohort survival technique is utilized, assuming that the migration patterns of the last decade and the low birth rates of the past two years will continue. The projections indicate the number of persons in the city limits will remain fairly stable. However, the racial and age distribution will change: the black population will rise from roughly one-half to two-thirds of the total; and the median age of both races will increase by three years. Other methods of population projection are also utilized and compared. The 1970 census forms the statistical basis of this analysis.

SU-326-P-33-X-2/GA PC$3.50/MF$1.45
Stanford Univ., Calif.
EVOLUTION OF SURNAMES: AN ANALYSIS OF THEIR DISTRIBUTION AND EXTINCTION.
N. Yasuda, L. L. Cavalli-Sforza, M. Skolnick, and A. Moroni. 1972, 27p
Contract AT(04-3)-326

Descriptors: (*Human populations, *Genetics), Population dynamics.

For abstract, see NSA 28 07, number 17816.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-768 488/9GA Reprint
Army Medical Research and Nutrition Lab Denver Colo
OXALATE METABOLISM. I,
Louis Hagler, and Robert H. Herman. Aug 73, 8p
See also report dated Aug 73, AD-768 489.
Availability: Pub. in American Jnl. of Clinical Nutrition v26 p758-765 Jul 73.

Descriptors: (*Oxalates, *Metabolism), (*Calculi, *Urinary system), Urine, Excretion, Kidneys, Physiology, Pathology, Metabolic diseases, Glycolysis, Nutrition.
Identifiers: Calcium oxalates, Hyperoxaluria.

The association of oxalates with human disease is of considerable importance. It has been estimated that two-thirds of all kidney stones and over three-fourths of endemic bladder stones contain calcium oxalate. In stones, calcium oxalate is present primarily as the monohydrate and to a lesser extent as the dihydrate. Few stones consist entirely of calcium oxalate, and most are mixed with apatite or other substances. Most patients with oxalate calculi have no primary disorder of oxalate metabolism and excrete normal amounts of oxalate in the urine. Some others may have a variety of disorders with hypercalciuria which leads to increased oxalate excretion as well. This is particularly true in patients who tend to form calcium-containing stones. Yet another group of patients is presumed to have a change in the physicochemical characteristics of urine leading to stone formation despite normal calcium and oxalate excretion. Hyperoxaluria may also result from the ingestion of oxalate or its precursors, or from vitamin B6 deficiency. Reviews are presented on oxalate metabolism and its abnormalities.

AD-768 489/7GA Reprint
Army Medical Research and Nutrition Lab Denver Colo
OXALATE METABOLISM. II,
Louis Hagler, and Robert H. Herman. Aug 73, 8p
See also Part I, AD-768 488 and Part 3, AD-768 490.
Availability: Pub. in American Jnl. of Clinical Nutrition, v26 n8 p882-889 Aug 73.

Descriptors: (*Oxalates, Metabolism), (*Calculi, Urinary system), Diet, Nutrition, Deficiency diseases, Vitamin B complex, Pathology, Physiology, Metabolic diseases, Excretion, Urine, Calcium.
Identifiers: Calcium oxalates, Hyperoxaluria.

The presence of oxalate in the diet is important because it influences the availability of dietary calcium and magnesium, as well as adding to the level of oxalate to be excreted. Increased amounts of dietary oxalate will significantly decrease calcium and magnesium absorption through the formation of insoluble oxalates. This assumes pratical significance in dietary recommendations, especially to patients with calcium deficiency states. Under these circumstances, a high oxalate diet is to be avoided in order to prevent the complication of oxalate nephrolithiasis and the aggravation of the underlying calcium deficiency state.

AD-768 490/5GA Reprint
Army Medical Research and Nutrition Lab Denver Colo
OXALATE METABOLISM. III,
Louis Hagler, and Robert H. Herman. Aug 73, 5p
See also Part 2, AD-768 489.
Availability: Pub. in the American Jnl. of Clinical Nutrition, v26 p1006-1010 Sep 73.

Descriptors: (*Oxalates, *Metabolism), (*Calculi, *Urinary system), Excretion, Urine, Kidneys, Pathology, Physiology, Calcium, Magnesium, Metabolic diseases, Sex, Aging(Physiology), Rural areas, Urban areas, Nutrition.
Identifiers: Calcium oxalates, Hyperoxaluria.

As well as being one of man's oldest problems, urinary tract stones are also one of the most common. Calculi may occur anywhere in the urinary tract. Bladder and kidney stones differ clinically in ways beyond location alone. Bladder stones tend to be endemic in certain technically evolving areas of the world, and in these areas, over 80% of urinary calculi occur in the bladder of young boys. Similar stone disease existed in western countries over 100 years ago but began to disappear with improvement in the standard of living and nutrition. At the present time in western countries, bladder stones account for only 5% of urinary calculi and occur primarily in elderly men. Stones in children account for only 1% of all urinary calculi in western countries. In contrast, kidney stones consist mainly of calcium oxalate and calcium phosphate. These stones have shown a slowly increasing incidence in technically developed western countries and usually occur in young adults. The male-female ratio of kidney stones is 2 to 3:1. The reasons for differences in location and composition of stones and their relationship to patient age and sex are explored.

AD-768 685/0GA Reprint
Oklahoma Univ Health Sciences Center Oklahoma City
THE METABOLISM OF GALACTOSE BY GALACTOSEMIC FIBROBLASTS IN VITRO,
Jary S. Mayes, and Leonard R. Miller. 18 Dec 72, 8p
Contract N00014-69-A-0385, Grant PHS-AM-13325
Availability: Pub. in Biochimica et Biophysica Acta, v313 p9-16 1973. (BBA 27144).

Descriptors: (*Carbohydrates, *Metabolic diseases), Deficiency diseases, In vitro analysis, Metabolism, Tissues(Biology), Tissue culture.
Identifiers: *Galactose, *Galactosemia.

Galactose metabolism was studied in normal and galactosemic fibroblasts in vitro. Galactosemic fibroblasts accumulated large amounts of galactose-1-P when placed on a medium containing galactose. The intracellular concentration of galactose-1-P reached a maximum after 2 h of exposure, but this metabolite decreased in concentration in the galactosemic cells with prolonged time of incubation. Normal fibroblasts had a minimal concentration of intracellular galactose-1-P and fibroblasts from individuals heterozygous for galactosemia showed an intermediate concentration of galactose-1-P. When grown on glucose (galactose-free) medium, the galactosemic cells also accumulated glactose-1-P. The enzymatic reactions most likely responsible for this synthesis are UDPgalactose 4-epimerase followed by UDP-galactose pyrophosphorylase or UDPgalactose repimerase followed by hydrolyses of the UDP-galactose by a pyrophosphatase. (Modified author abstract)

AD-768 686/8GA Reprint
Oklahoma Univ Health Sciences Center Oklahoma City
LOCALIZATION OF THE ENZYMES OF KETOGENESIS IN RAT LIVER MITOCHONDRIA,
M. John Chapman, Leonard R. Miller, and Joseph A. Ontko. 17 Apr 73, 23p

Contract N00014-69-A-0385-0003, Grant PHS-HL-13302
Sponsored in part by Grant PHS-HL-12806. Revision of report dated 16 Nov 72.
Availability: Pub. in The Jnl. of Cell Biology, v58 p284-306 1973.

Descriptors: (*Ketones, Biosynthesis), (*Enzymes, Ketones), (*Mitochondria, Ketones), Liver, Metabolism, Biochemistry.

To investigate further the intramitochondrial localization of the enzymes of ketogenesis, the authors studied the formation of ketone bodies and the activity of the enzymes of the beta-hydroxy-beta-methylglutaryl CoA (HMGCoA) cycle in each of the soluble and membranous compartments of rat liver mitochondria. The mitochondrial subfractions, which correspond with these compartments, have been characterized by the activities of 'marker' enzymes and by electron microscopy.

AD-768 762/7GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
COLLECTION, DETECTION, IDENTIFICATION, AND QUANTITATION OF HUMAN EFFLUENTS.
Technical rept.,
Robert I. Ellin, Richard L. Farrand, Fred W. Oberst, Charles L. Crouse, and Norman B. Billups. Oct 73, 26p Rept nos. EA-TR-4779, EB-TR-73007

Descriptors: (*Body fluids, *Gas analysis), (*Excretion, Gas analysis), (*Respiration, Gas analysis), Metabolism, Test equipment, Organic compounds, Gas chromatography, Mass spectroscopy, Spectrum analyzers, Sampling, Isoprene, Acetones, Ethanols, Butanols, Toluenes.

In a previous study of methods and instrumentation for measuring trace amounts of the total effluvai from man, only 12 compounds were identified. In the present study, using refinements of the methods, over 135 effluents have been identified. Two to three times this number of compounds were observed in the sensitive gas chromatograph-mass spectrometer (GC-MS) analytical system, but could not be identified. A variety of organic structures are included among these effluents. In addition to alcohols and ketones, unsaturated, branched, cyclic and aromatic hydrocarbons, sulfhydryl and cyano and a variety of heterocyclic compounds were found. The most significant change in the method is the replacement of the cryogenic collection system with porous polymer collectors. The latter can be used to collect effluents at room temperature, to absorb more effluents in a shorter time, can be connected in parallel to the chamber, and can be cleaned and desorbed without using vacuum. (Modified author abstract)

AD-768 808/8GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
POLYMORPHISMUS DER ADENOSINEDESAMINASE. UNTERSUCHUNG AN EINER STICHPROBE AUS DER BERLINER BEVOLKERUNG (ADENOSINE DEAMINASE POLYMORPHISM. STUDY ON A POPULATION SAMPLE FROM WEST-BERLIN),
Hans LeFebre, and Ruth Niebuhr. 8 May 70, 4p
Text in German; attached summary in English.
Availability: Pub. in Humangenetik (West Germany) v10 p88-90 1970.

Descriptors: (*Enzymes, *Genetics), West Germany, Population.
Identifiers: *Deaminase/adenosine.

The ADA isoenzyme patterns in the blood of 500 unselected individuals living in West-Berlin have been determined. The found gene frequencies are ADA(1) = 0.942 and ADA(2) = 0.058. (Author)

AD-768 817/9GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
COMPARISON OF THE INFLUENCE OF SPERMIDINE AND MONOVALENT SALTS ON RNA SYNTHESIS,
Eiko E. Petersen, and Hans Kroeger. 11 Apr 70, 7p
Availability: Pub. in Zeitschrift fuer Naturforschung (West Germany) v25b n9 p1042-1046 1970.

Descriptors: (*Ribonucleic acids, Biosynthesis), (*Salts, Ribonucleic acids), Stimulation, Nucleic acids, West Germany.

The influence of spermidine and salts on the RNA synthesis was compared. Spermidine as well as salts stimulate the RNA synthesis, catalyzed by the RNA nucleotidyltransferase and directed by native, double-stranded calf thymus DNA. However, for maximal synthesis both are necessary, because salts prevent the precipitation of the DNA at optimal spermidine concentration (10 mM). Spermidine stimulates the RNA synthesis by creating new RNA chains. On the contrary salts stimulate the RNA synthesis by creating new RNA chains. On the contrary salts stimulate the RNA synthesis by elongation of the RNA chains. The inhibition of the RNA synthesis by rifampicine, added 5 min after the start of the RNA synthesis, is strongly intensified in the presence of spermidine or high salt concentrations. (Author)

AD-768 833/6GA PC$3.00/MF$1.45
Army Medical Research Inst of Infectious Diseases Frederick Md
CROSS-LINKING OF 'COARSE' AND 'FINE' FIBRIN GELS,
E. L. Khodorova, T. V. Svechnikova, and K. O. Smekhova. 1973, 16p
Trans. of Ukrayinskyi Biokhimichnyi Zhurnal (USSR) v44 n1 p26-33 1972.

Descriptors: (*Fibrin, *Gels), Polymerization, Purification, Stability, Blood coagulation, USSR.
Identifiers: Translations.

The authors develop a modification for a method of isolating the factor which stabilizes fibrin from the blood plasma of cattle. With use of this method it is possible to purify fibrin by a factor of 300 times. The reaction of covalent 'stitching' of fibrin takes place with great speed in the 'coarse' gels which are generated in the process of polymerization of the fibrin monomer at pH of 7.6 and ionic strength of 0.14. In the 'fine' gels, which arise at low values of ionic strength of the medium and also in the presence of NaNO3, the reaction referred to is retarded. In the 'coarse' gels, there is predominant a formentation of stabilization; this is sensitive to the ionic strength of the medium within the range from 0.14 to 0.23. (Author)

AD-768 834/4GA PC$3.00/MF$1.45
Army Medical Research Inst of Infectious Diseases Frederick Md
A STUDY OF FIBRIN POLYMERIZATION WITH USE OF NEUTRAL SALTS,
E. V. Lugovskoi, and V. A. Belitser. 1973, 16p
Trans. of Biokhimiya (USSR) v36 n1 p129-137-1971.

Descriptors: (*Fibrin, Polymerization), (*Salts, Fibrin), Chemical bonds, Molecular properties, USSR.
Identifiers: Translations.

The authors demonstrate that sodium chloride and a number of other salts in low concentration inhibit the polymerization of monomeric fibrin, and in high concentration accelerate its polymerization. On the basis of accelerating action, salts can be arranged in the following scale: citrate, sulfate, phosphate, acetate, chloride. The accelerating effect of a salt increases along with temperature.

AD-768 939/1GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
IDENTIFICATION OF ONE OF THE L-SERINE DEHYDRATASE ISOENZYMES FROM RAT LIVER AS L-HOMOSERINE DEHYDRATASE,
Jiro Hoshino, Dietrich Simon, and Hans Kroeger. 24 Jun 71, 7p
Availability: Pub. in Biochemical and Prophysical Research Communications, v44 n4 p872-878 1971.

Descriptors: (*Enzymes, Identification), Molecular weight, Centrifuge separation, Chromatographic analysis, West Germany.
Identifiers: *Dehydratases/L-serine.

The higher molecular weight L-serine dehydratase was purified from rat liver and fractionated into two active components by Sephadex G-200 gel chromatography. On the basis of molecular weight, ultracentrifugal pattern and substrate specificity of the major component, it was concluded that this component is identical to L-homoserine dehydratase. Some misinterpretations which have been derived from the work on L-serine dehydratase in animal tissues are pointed out. (Author)

AD-768 941/7GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
EINFLUSS VON CARCINOGENEN NITROSAMINEN AUF DIE INDUKTION DER SERIN-DEHYDRATASE IN DER RATTEN-LEBER (THE INFLUENCE OF CARCINOGENICE NITROSAMINES ON THE INDUCTION OF SERINE DEHYDRATASE IN THE RAT LIVER),
H. Jennissen, J. Hoshino, and H. Kroeger. 7 Dec 70, 8p
Revision of report dated 17 nov 70. Text in German; attached summary in English.
Availability: Pub. in Zeitschrift fuer Krebsforchung (West Germany) v75 p246-252 1971.

Descriptors: (*Nitroso compounds, *Cancer), (*Enzymes, Nitroso compounds), Amines, Liver, Rats, West Germany.
Identifiers: *Dehydratases/serine, Carcinogens.

Nitrosamine-associated carcinogensis disturbs the regulatory systems for various enzymes in the liver of rats. In the present paper, the influences of N-nitroso morpholine and diethyl-nitrosamine on the induction of serine dehydratase by casein hydrolysate and fasting were studied. Induction by casein remains unaffected by these two substances. Under diethyl-nitrosamine diet, induction by fasting is considerably increased, whereas N-nitroso morpholine shows no effect. By using glucose it was established, that the increased enzyme activity subsequent to induction by fasting is a consequence of an increased enzyme synthesis. (Author)

AD-769 097/7GA Reprint
Princeton Univ N J Dept of Biology
FURTHER DATA ON THE SPECIFICITY OF AEQUORIN LUMINESCENCE,
Osamu Shimomura, and Frank H. Johnson. 5 Jun 73, 8p
Contract N00014-67-A-0151-0025, Grant NSF-GB-30963X
Availability: Pub. in Biochemical and Biophysical Research Communications, v53 n2 p490-494 1973.

Descriptors: (*Luminescence, *Proteins), Biophysics, Biochemistry, Microanalysis, Calcium, Physiology.
Identifiers: Aequorin, *Bioluminescence.

The possible triggering of luminescence of the photoprotein aequorin by 11 kinds of metal ions, in concentrations from 0.001 to 0.000001 M, at pH 6.0 and at pH 8.0, were examined under conditions which minimized contamination with extraneous Ca(2+). Y(3+) and La(3+) were found to have activities nearly as great as that of Ca(2+) at pH 6.0, but gave evidence of quenching effects in the higher concentrations at pH 8.0. Cations indicating no activity, or only negligible activity at either pH 6.0 and 8.0 included Be(2+), Ba(2+), Co(2+),

Ni(2+), and Cu(2+). Considerable activity was shown by Pb(2+) and Cd(2+) at pH 6.0, but very little at pH 8.0.

CONF-730547-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
IDENTIFICATION OF N-NITROSO COMPOUNDS BY MASS SPECTROMETRY.
W. Lijinsky, W. T. Rainey, and W. H. Christie. 5p

Descriptors: (*Nitroso compounds, *Mass spectroscopy), Carcinogens, Chemical analysis.

For abstract, see NSA 28 07, number 17737.

CONF-730634-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
CRITICAL EVALUATION OF PROTEIN CRYSTALLOGRAPHIC RESULTS.
C. K. Johnson. 1973, 12p

Descriptors: (*Proteins, *Crystallography), Molecular structure.

For abstract, see NSA 28 07, number 17740.

COO-3162-14/GA PC$4.00/MF$1.45
Cornell Univ., Ithaca, N.Y. Div. Of Biological Sciences. Washington Univ., Seattle (Usa). Dept. Of Biochemistry. Rockefeller Univ., New York. Cornell Univ., Ithaca, N. Y.
PIGMENT CONTENT AND MOLAR EXTINCTION COEFFICIENTS OF PHOTOCHEMICAL REACTION CENTERS FROM RHODOPSEUDOMONAS SPHEROIDES.
S. C. Straley, W. W. Parson, D. C. Mauzerall, and R. K. Clayton. 1972, 39p
Contract (11-1)-3162

Descriptors: (*Rhodopseudomonas, *Photosynthesis), Absorption spectra, Chlorophyll, Fluorescence, Laser radiation, Pigments.

For abstract, see NSA 28 07, number 17755.

COO-3162-16/GA PC$3.00/MF$1.45
Cornell Univ., Ithaca, N. Y.
STUDIES OF PHOTOSYNTHETIC ENERGY CONVERSION. ANNUAL PROGRESS REPORT FOR THE PERIOD SEPTEMBER 1, 1972--AUGUST 31, 1973.
R. K. Clayton. 12p
Contract AT(11-1)-3162

Descriptors: (*Rhodopseudomonas, Photosynthesis), (*Photosynthesis, *Chemical reaction kinetics), Chlorophyll, Fluorescence, Photochemistry, Pigments, Proteins, Spectroscopy.

For abstract, see NSA 28 07, number 17756.

COO-3400-16/GA PC$3.00/MF$1.45
Pennsylvania Univ., Kennett Square. School of Veterinary Medicine.
GLUCOSE, MILK PRODUCTION, AND KETOSIS.
D. S. Kronfeld. 1972, 8p

Descriptors: (*Milk, *Biosynthesis), Cattle, Glucose, Ketones, Lactation, Metabolism, Nutrients, Secretion.

For abstract, see NSA 28 07, number 17757.

FMI-1000-433/GA PC$3.75/MF$1.45
North Carolina Univ., Chapel Hill. Chicago Univ., Ill. Argonne Cancer Research Hospital, Chicago, Ill.
BIOCHEMISTRY OF THE INTERACTION OF BOVINE FACTORS XIA AND IX.
R. L. Lundblad, and H. S. Kingdon. 1972, 34p
CONF-730127-1

Descriptors: (*Blood coagulation, *Biochemistry), Blood, Blood serum, Calcium compounds, Cations, Cattle, Chromatography, Copper compounds, Enzymes, Peptides, Strontium compounds, Zinc compounds.

For abstract, see NSA 28 07, number 17762.

LA-UR-73-676/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
SEQUENTIAL BIOCHEMICAL EVENTS IN PREPARATION FOR DNA REPLICATION AND MITOSIS.
R. A. Tobey, L. R. Gurley, C. E. Hildebrand, R. L. Ratliff, and R. A. Walters. 1973, 39p CONF-730543-1
Contract W-7405-eng-36

Descriptors: (*Cell cycle, *Inhibition), (*Animal cells, Cell cycle), Amino acids, Biochemistry, Cell cultures, Cell proliferation, Dna replication.

For abstract, see NSA 28 07, number 17775.

LA-UR-73-929/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
HISTONE PHOSPHORYLATION IN G SUB 2 AND MITOSIS.
L. R. Gurley, R. A. Walters, and R. A. Tobey. 1973, 15p CONF-730443-1
Contract W-7405-eng-36

Descriptors: (*Histones, *Phosphorylation), (*Mitosis, Phosphorylation), Animal cells, Biochemical reaction kinetics, Cell cultures, Cell cycle, Dna, Hamsters, Metabolism, Phosphorus 32, Tracer techniques, Tritium.

For abstract, see NSA 28 07, number 17777.

LA-UR-73-941/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
INCORPORATION OF CARBON-13 INTO FETAL AND MATERNAL PROTEIN AND NUCLEIC ACID DURING VARIOUS INTERVALS OF PREGNANCY IN MICE.
C. Gregg, D. Smith, D. Ott, J. Malanify, and B. McInteer. 1973, 13p CONF-730717-1
Contract W-7405-eng-36

Descriptors: (*Carbon 13, *Metabolism), (*Proteins, *Labelling), (*Nucleic acids, Labelling), Fetuses, Gamma detection, Mass spectroscopy, Mice, Pregnancy, Proton reactions, Quantitative chemical analysis, Radiometric analysis.

For abstract, see NSA 28 08, number 17911.

N73-30990/8GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
FLUOROMETRIC 11-HYDROXY-CORTICOSTEROID ASSAY IN HUMAN BLOOD PLASMA.
Y. Popens, E. Silinsh, and I. Vitols. Sep 73, 13p
NASA-TT-F-15092
Contract NASW-2481
Tran-Transl. Into English from Vopr. Med. Khim. (Moscow), V. 14, No. 6, 1968 p 628-634.

Descriptors: *Bioassay, *Fluorescence, *Hydroxycorticosteroid, Blood plasma, Clinical medicine, Human body, Quantitative analysis.

For abstract, see STAR 1122

N73-30997/3GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
METHODS OF DETERMINATION OF HYDROXYPROLINE IN BIOLOGICAL FLUIDS AND THEIR USE IN CLINICAL PRACTICE.
A. A. Krel, and L. N. Furtseva. Sep 73, 12p
NASA-TT-F-15093
Contract NASW-2481
Tran-Transl. Into English from Vopr. Med. Khim. (Moscow), V. 14, No. 6, 1968 p 635-640.

Descriptors: *Collagens, *Hydroxyl compounds, *Urine, Bones, Diseases, Proteins.

For abstract, see STAR 1122

ORO-4310-2/GA PC$3.00/MF$1.45
Smithsonian Institution, Washington, D. C. Radiation Biology Lab.
PHYCOBILIPROTEIN CHARACTERISTICS AND MEMBRANE ASSOCIATION. PROGRESS REPORT, OCTOBER 15, 1972--OCTOBER 14, 1973.
E. Gantt. 1973, 10p
Contract AT(40-1)-4310

Descriptors: (*Algae, *Biochemistry), Biological models, Energy transfer, Fluorescence spectroscopy, Immunology, Membranes, Molecular weight, Pigments, Proteins.

For abstract, see NSA 28 07, number 17795.

PB-224 003/4GA PC$3.00/MF$1.45
Beth Israel Hospital, Boston, Mass. Renal Unit.
THE ROLE OF GUANIDINE COMPOUNDS IN THE PATHOGENESIS OF THE UREMIC SYNDROME.
Final rept. 14 Jun 71-20 Jan 73,
Israel M. Stein, Michael Micklus, and Howard S. Frazier. 20 Jan 73, 47p AK-1-71-2328
Contract PHS-71-2328

Descriptors: (*Guanidines, *Uremia), Metabolism, Blood serum, Urine, Toxicity, Pathology, Physiology, Biochemistry.

Using ion exchange chromatography for fractionation and the Voges-Proskauer and the Staron and Allard reactions for colorimetric estimation, guanidine (G), methylguanidine (MG), 1,1-dimethylguanidine (DMG) have been examined in the body fluids of patients with renal failure. A significant increase in the urinary excretion of MG was noted in chronic renal failure, whereas the excretion of G was not significantly increased. In chronic renal failure, mean serum levels of G and MG were 0.03 and 0.04 mg/100 ml, respectively, and were higher than in control sera, in which no evidence of G or MG could be found. DMG was not identified in either serum or urine of control or uremic patients. The serum levels of G, MG, and DMG are not markedly elevated in renal failure, and it is therefore unlikely that they contribute to uremic toxicity. The role of the disubstituted guanidines is presently under investigation.

UR-3055-6/GA PC$22.00/MF$1.45
Rochester Univ., N. Y. Dept. Of Radiation Biology and Biophysics.
APPLICATION OF THE ELECTRON PROBE MICROANALYZER TO THE QUANTITATIVE ANALYSIS OF BIOLOGICAL MATERIAL AND THE ANALYSIS OF INTESTINAL CALCIUM TRANSPORT.
R. R. Warner. 1972, 398p

Descriptors: (*Biological materials, *Microanalysis), (*Calcium, Microanalysis), B codes, Chickens, Computer codes, Distribution, Electron probes, M codes, Rats, Small intestine.

For abstract, see NSA 28 07, number 17825.

UR-3490-292/GA PC$3.00/MF$1.45
Rochester Univ., N. Y. Dept. Of Radiation Biology and Biophysics.
SODIUM AND POTASSIUM CONTENT OF SINGLE CELLS: EFFECTS OF METABOLIC AND STRUCTURAL CHANGES.
E. J. Barrett, and J. R. Coleman. 1973, 4p CONF-730809-2

Descriptors: (*Sodium, *Diffusion), (*Potassium, Diffusion), (*Cell membranes, *Permeability), Chickens, Electron probes, Erythrocytes, In vivo, Metabolism.

For abstract, see NSA 28 07, number 17828.

UR-3490-293/GA PC$4.00/MF$1.45
Princeton Univ., N.J. Dept. Of Biochemical Sciences. Rochester Univ., N. Y. Dept. Of Radiation Biology and Biophysics.
PROTEINS OF THE T4 BACTERIOPHAGE REPLICATION APPARATUS.
J. Barry, H. Hama-Inaba, L. Moran, J. Wiberg, and B. Alberts. 1972, 39p CONF-720689-1

Descriptors: (*Proteins, *Biosynthesis), (*Dna, Biosynthesis), Bacteriophages, Escherichia coli, In vitro.

For abstract, see NSA 28 08, number 20660.

UR-3490-299/GA PC$3.00/MF$1.45
Rochester Univ., N. Y. School of Medicine and Dentistry.
ELECTRON PROBE ANALYSIS OF CALCIUM CONTAINING LIPID DROPLETS IN TETRAHYMENA PYRIFORMIS.
J. R. Coleman. 4p CONF-730809-3

Descriptors: (*Tetrahymena, *Lipids), (*Bone tissues, *Mineralization), Calcium, Cytoplasm, Electron probes.

For abstract, see NSA 28 07, number 17829.

6B. Bioengineering

PAT-APPL-386789/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ULTRASONIC BONE DENSITOMETER.
Patent Application.
J. M. Hoop. Filed 8 Aug 73, 14p NASA-CASE-MFS-20994-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Bones, *Calcium, *Densitometers, *Ultrasonic wave transducers, Medical equipment, Patent applications.

A pair of opposed spaced ultrasonic transducers are held within a clamping apparatus closely adjacent the bone being analyzed. These ultrasonic transducers include piezoelectric crystals shaped to direct signals through the bone encompassed in the heel and finger of the subject being tested. A pulse generator is coupled to one of the transducers and generates an electric pulse for causing the transducers to generate an ultrasonic sound wave which is directed through the bone structure to the other transducer. An electric circuit, including an amplifier and a bandpass filter couples the signals from the receiver transducer back to the pulse generator for retriggering the pulse generator at a frequency proportional to the duration that the ultrasonic wave takes to travel through the bone structure being examined. An oscilloscope and frequency counter is coupled to the bandpass filter for determining the frequency that the pulse generator is retriggered so as to determine changes in the calcium content of the bone being analyzed.

6C. Biology

AD-768 478/0GA Reprint
California Univ Berkeley Naval Biomedical Research Lab
IN VITRO DEVELOPMENT OF TWO SPECIES OF 'ORTHOHALARACHNE' (ACARINA: HALARACHNIDAE) AND ADAPTATIONS OF THE LIFE CYCLE FOR ENDOPARASITISM IN MAMMALS,
Deane P. Furman, and Alvin W. Smith. 1973, 2p
Availability: Pub. in Jnl. of Medical Entomology, v10 n4 p415-416, 31 Jul 73.

Descriptors: (*Parasites, Seals(Zoology)), (*Life cycle, Parasites), (*Mites, Life cycle), Mammals, Respiratory system, In vitro analysis.
Identifiers: Orthohalarachine diminuata, Orthohalarachine attenuata, Acarina, Halarachnidae, Marine mammals.

Halarachnid mites are parasites of the respiratory tracts of mammals. Two genera typically parasitize marine mammals of the suborder Pinnipedia; species of Orthohalarachne parasitize fur seals and sea lions of the family Otariidae, and the walrus of the family Odobenidae; species of Halarachne are found typically in members of the family Phocidae: gray seal, elephant seal, harbor seal, monk seal and Weddell seal.

AD-768 630/6GA Not available NTIS
Macdonald Coll Ste Anne de Bellevue Dept of Entomology
THE EGG AND CHORION OF 'POLLENIA RUDIS' (FABRICIUS) (DIPTERA: CALLIPHORIDAE),
P. G. Richards, and F. O. Morrison. 31 Jul 72, 4p
Availability: Pub. in Canadian Jnl. of Zoology, v50 n12 p1676 1678 1972.

Descriptors: (*Diptera, *Embryology), Eggs, Entomology, Respiration, Electron microscopy, Canada.
Identifiers: Pollenia rudis, Chorion.

The scanning electron microscope reveals that the egg of Pollenia rudis (Fabricius) is structurally suitable for a plastron method of respiration. (Author)

AD-768 666/0GA Not available NTIS
Macdonald Coll Ste Anne de Bellevue Dept of Entomology
POLLENIA RUDIS (DIPTERA: CALLIPHORIDAE) REARED ON ALLOLOBOPHORA CHLOROTICA (ANNELIDA: LUMBRIDICAE),
P. G. Richards, and F. O. Morrison. 3 Oct 72, 8p
Availability: Pub. in Phytoprotection, v54 n1 p1-8 Feb 73.

Descriptors: (*Diptera, *Worms), Parasites, Annelida, Larvae, Growth, Canada.
Identifiers: Pollenia rudis, Allolobophora chlorotica.

Observations on the form and development of the immature stages of Pollenia rudis (Fabricius) (Diptera: Calliphoridae) are presented. An adult female was reared parasitically on the earthworm Allolobophora chlorotica Savigny.

AD-768 745/2GA PC$3.00/MF$1.45
National Inst of Health Seoul (Republic of Korea) Div of Entomology
TAXONOMIC STUDY OF KOREAN MOSQUITOS.
Annual rept. no. 2, 30 Jun 72-29 Jun 73,
Kwan Woo Lee. 24 Sep 73, 32p ARDG-FE-482-2
Grant DA-RDRF-S92-544-72-G186

Descriptors: (*Culicidae, Classification), (*South Korea, Culicidae), Distribution, Tables, Insects, Larvae, Collecting methods.
Identifiers: Taxonomy.

The annual report covers all information on taxonomic survey of Korean mosquitos conducted intensively and extensively through-out South Korea during the past one year, from July 1972 to June 1973. The primary concern of this project is to determine the Korean mosquito fauna, to extend a key to the Korean species, and to prepare some specimens of each species for permanent deposit. The another concern is to provide the department of entomology of the 406th medical laboratory with some specimens of 19 rare species needed, when collected, for their enlarged edition of the Mosquito fauna of Japan and Korea. The larval collections were mainly carried out to obtain good specimens together with larval and pupal skins by using individual rearing in the laboratory. For adults, human biting, animal biting, resting place, dry ice and light trap collections were made to get some information about the rare species missing from larval collection. However, the materials caught by the methods mentioned above were not usually available for permanent mounting. (Author)

AD-769 027/4GA Not available NTIS
Alberta Univ Edmonton Dept of Entomology
THE DIGESTIVE PROCESSES OF HAEMATOPHAGOUS INSECTS. IV. SECRETION OF TRYPSIN BY 'AEDES AEGYPTI' (DIPTERA: CULICIDAE),
R. H. Gooding. 23 Oct 72, 6p
See also report dated 1972, AD-737 454.
Availability: Pub. in The Canadian Entomologist, v105 p599-603 Apr 73.

Descriptors: (*Insects, *Digestive system), (*Arthropods, Digestive system), Entomology, Physiology, Blood, Ingestion(Physiology), Enzymes, Salivary glands.
Identifiers: *Blood sucking insects.

There is a correlation between the amount of blood ingested by Aedes aegypti (L.) and the trypsin activity in the midgut 16 and 24 hr after feeding. Puromycin and dactinomycin ingested with a blood meal depress the level of midgut trypsin. Trypsin purified from the midguts of A. aegypti fed upon defibrinated blood containing (14)C-amino acids contains radioactivity. Midguts from blood-fed mosquitoes did not produce significant amounts of trypsin when dissected from mosquitoes and maintained in a tissue culture medium for up to 50 hr. (Author)

AD-769 080/3GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
BASELINE BLOOD DETERMINATIONS OF THE TAIWAN MACAQUE ('MACACA CYCLOPIS'),
James F. Taylor, Albert E. New, Chieh-Pao Chang, and Her-Shyang Chiang. 5 Mar 73, 10p
Rept no. NAMRU-2-TR-563
Availability: Pub. in Laboratory Animal Science, v23 n4 p582-587 1973.

Descriptors: (*Monkeys, *Blood analysis), (*Hematology, Monkeys), Primates, Taiwan, Tables, Blood chemistry, Hematology.
Identifiers: Macaca cyclops.

Peripheral hematologic and blood chemistry values were presented for adult Macaca cyclopis monkeys. These values represent post-quarantine, baseline determinations 79 animals, 47 females and 32 males. Comparisons were made between males and females for all clinical values, with the only differences noted in erythrocyte count, packed cell volume, hemoglobin, and alkaline phosphatase. In each case the male values were significantly higher ($p<.01$) than the females. These values were compared to previously published studies with Macaca mulatta, and differences were seen in the following parameters: potassium, chlorides, uric acid, and cholesterol. Macaca cyclopis values for potassium were slightly above the cited range of values for Macaca mulatta, while the other three determinations fell slightly below the published ranges. These apparent differences were discussed in relation to other Macaca species blood chemistry value comparisons. (Author)

AD-769 085/2GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
DESCRIPTION OF ONCOMELANIA HUPENSIS LINDOENSIS, FIRST INTERMEDIATE HOST OF SCHISTOSOMA JAPONICUM IN SULAWESI (CELEBES),
George M. Davis, and W. Patrick Carney. 1973, 35p Rept no. NAMRU-2-C5-075

Availability: Pub. in Proceedings of the Academy of Natural Sciences in Philadelphia, v125 n1 p1-34, 27 Jun 73.

Descriptors: (*Gastropoda, *Schistosoma), Disease vectors, Indonesia, Worms, Parasites, Parasitic diseases.
Identifiers: Schistosoma japonicum, *Oncomelania hupensis lindoensis.

Oncomelania hupensis lindoensis is described as a subspecies new to science. The discovery of this snail, which transmits the human blood fluke Schistosoma japonicum in central Sulawesi (Celebes), extends the known range of Oncomelania from its hitherto southern limit in the Philippines. (Author)

AD-769 088/6GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
NEST LOCATION OF RATTUS COXINGS,
Gwilym S. Jones. 1973, 1p Rept no. NAMRU-2-SP-30
Availability: Pub. in Quarterly Jnl. of the Taiwan Museum, v26 n1/2 Jun 73.

Descriptors: (*Taiwan, Rats), (*Rats, Behavior), Rodents, Ecology.
Identifiers: Rattus coxinga.

The brief report discusses the nests or nesting sites of species of the genus Rattus.

AD-769 089/4GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
THE PUBLICATIONS OF ROBERT SWINHOE,
Gwilym S. Jones. 1973, 8p Rept no. NAMRU-2-SP-29
Availability: Pub. in Quarterly Jnl. of the Taiwan Museum, v26 n1/2 p121-127 Jun 73.

Descriptors: (*Scientific personnel, *Biology), (*Scientific research, Biology), History.
Identifiers: *Swinhoe Robert, *Scientists, Zoology.

Robert Swinhoe's life, his interest in natural history, and his participation in the early zoological exploration of the Orient were briefly documented by Takahashi, but his published works were not listed. His publications are of immeasurable value because they contain some of the earliest observations on the natural history of the area and also numerous descriptions of new taxa--187 birds and 15 mammals from Taiwan alone. Naturalists and systematists will find his work of interest; historians will find his publications valuable in that he was thorough in documenting his travels.

ANL/ESP-1/GA PC$4.00/MF$1.45
Argonne National Lab., Ill.
FISH PROTECTION AT WATER DIVERSIONS AND INTAKES: A BIBLIOGRAPHY OF PUBLISHED AND UNPUBLISHED REFERENCES.
R. K. Sharma. May 73, 36p
Contract W-31-109-eng-38

Descriptors: (*Fishes, *Bibliographies), Aquatic ecosystems, Injuries, Sampling.

For abstract, see NSA 28 08, number 20598.

BNL-18006/GA PC$4.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
EVOLUTIONARY AND DEVELOPMENTAL CONSIDERATIONS OF THE VARIABILITY OF NUCLEAR PARAMETERS IN HIGHER PLANTS. I. GENOME VOLUME, INTERPHASE CHROMOSOME VOLUME, AND ESTIMATED DNA CONTENT OF 236 GYMNOSPERMS.
H. J. Price, A. H. Sparrow, and A. F. Nauman. 1973, 40p CONF-730643-2

Descriptors: (*Trees, *Biological variability), (*Cell nuclei, *Volume), Chromosomes, Conifers, Dna, Genetic variability, Genotype, Quantity ratio.

For abstract, see NSA 28 08, number 20605.

COM-73-11636/0GA PC$3.75/MF$1.45
Utah State Univ., Logan.
INVESTIGATION OF THE INTENSITY OF NATURAL SELECTION UPON DIFFERENT PHENOTYPES (BLOOD TYPES) OF RAINBOW TROUT IN COMMERCIAL TROUT REARING PONDS AND RESERVOIRS.
Completion rept. Apr 67-May 71,
Clair B. Stalnaker. May 73, 31p NOAA-73082802
Grant NMFS-6-10-R
Sponsored in part by Utah Dept. of Natural Resources, Salt Lake City.

Descriptors: (*Trout, *Genetics), (*Fishes, Genetics), Blood groups, Ponds, Reservoirs, Breeding.
Identifiers: *Natural selection, Phenotypes, Genotypes, Rainbow trout.

The intensity of natural selection is a function of all the environmental factors present, including competition with other species, and could be a useful tool in manipulation of large populations such as are found in the many large reservoirs in the U.S., the Great Lakes, and the anadromous populations of the oceans. The research program of the Utah Cooperative Fishery Unit had the following major objectives: To examine the extent of phenotypic variation among rainbow trout strains by serological methods; to establish the phenotypic frequencies among strains; to initiate progeny tests to establish inheritance patterns and genotypes; and to measure rainbow trout phenotypic fitness in rearing ponds.

COM-73-11642/8GA PC$3.00/MF$1.45
Delaware Univ., Newark. Coll. of Marine Studies.
TECHNIQUES AND INSTRUMENTATION TO CONTROL SOME ENVIRONMENTAL FACTORS FOR SHELLFISH NUTRITIONAL STUDIES,
Ramesh C. Dwivedy. Sep 73, 27p DEL-SG-11-73 NOAA-73091701
Contract NOAA-2-35223
Also pub. as Delaware Agricultural Experiment Station, Newark, Bull-403.

Descriptors: (*Oysters, Feeding habits), Aquaculture, Light(Visible radiation), Animal nutrition, Shellfish, Feeding stuffs, Isotopic labeling, Equipment.
Identifiers: Sea Grant program.

Techniques and instrumentation were developed that allow positive control over environmental factors such as feed density, flow rate, flow volume, light, etc. for oyster feeding studies in a recirculating system. They are also suitable for feeding studies using labelling materials such as radioactive tracers to determine acceptance, rejection and utilization level of a given feed by the oyster. (Author)

COM-73-11646/9GA PC$3.50/MF$1.45
Moss Landing Marine Labs., Calif.
A PRELIMINARY CHECK-LIST OF THE MARINE ALGAE OF THE MOSS LANDING JETTY: AN ANNOTATED FLORISTIC COMPILATION.
Annual rept. on Part 7,
James B. Jensen, and Sara J. Tanner. May 73, 63p
Contrib-38, CASUC-MLML-TP-37-07 NOAA-73091902
Contract NOAA-2-35137

Descriptors: (*Plants(Botany), California), (*Jetties, *Plant ecology), (*Algae, Jetties), Aquatic plants, Inlets(Waterways), Chlorophyta, Phaeophyta, Rhodophyta, Limnology, Benthos, Biomass, Taxonomy, Classifications, Sites.
Identifiers: Sea Grant program.

The check-list represents a summary of floristic data collected over a period of nine months (September, 1971 - July, 1972) in connection with a study of the jetty at Moss Landing, California. The purpose of this work, then, is to establish a basic flora upon which ecological analyses can be begun. This compilation is preliminary also because a flora is never complete; it is to be expected that new discoveries will be made, particularly of the smaller, physically less significant species; the authors have made several such additions during the last few weeks of the compilation. One table provides a synopsis of the relative abundance and the location of all of the species detected. A special feature is the inclusion of a set of keys to all of the species detected thus far. Included are: chlorophyta, phaeophyta and rhodophyta.

COM-73-11688/1GA PC$3.00/MF$1.45
Oregon Fish Commission, Portland. Div. of Management and Research.
TILLAMOOK BAY ESTUARY RESOURCE USE STUDY - 1971,
Tom Gaumer, Darrell Demory, and Laimons Osis. Aug 73, 30p NOAA-73092104
Contract DACW57-72-C-0138, Grant NOAA-043-55
Sponsored in part by Army Corps of Engineers, Washington, D.C.

Descriptors: (*Fisheries, Recreation), (*Tillamook Bay, Fisheries), Marine fishes, Shellfish, Invertebrates, Fishing grounds, Estuaries, Fishing, Statistical data, Oregon.
Identifiers: Sport fishing.

In 1971 the Fish Commission of Oregon studied the recreational use of marine food fish, shellfish, and miscellaneous invertebrates in Tillamook Bay, Oregon. The anadromous sport fishery in the upper portion of this estuary was excluded. Marine resource maps were prepared using information from this and previous Fish Commission studies. From March 1 through October 31, 1971, boat and shore anglers, and tideflat users were interviewed for catch, effort, and angler origin data. Analysis of the recreational data revealed that 66,500 resource user trips (24,500 boat, 17,500 shore, and 24,500 tideflat) were expended in Tillamook Bay during the study. Anglers of the three fisheries harvested 703,400 animals (613,800 clams, 36,400 miscellaneous invertebrates, 32,800 crabs, and 20,400 fish). Crabs comprised 93% of the boat anglers' catch with Dungeness crab the principal species caught. Fish represented 98% of the shore anglers' catch with pile perch the most common species caught. Clams made up 94% of the tideflat users' take. (Modified author abstract)

COM-73-11749/1GA PC$..75/MF$1.45
Hawaii Div. of Fish and Game, Honolulu.
MANAGEMENT INVESTIGATION OF THE AKLUE OR BIGEYE SCAD 'TRACHUROPS CRUMENOPHTHALMUS' (BLOCH).
Completion rept.,
Paul Y. Kawamoto. May 73, 33p NOAA-73073004

Descriptors: (*Fishes, Growth), (*Fisheries, *Hawaii), Maturation, Feeding habits, Animal migrations, Marking, Reproduction(Biology), Taxonomy.
Identifiers: Trachurops crumenophthalmus.

The akule (Trachurops crumenophthalmus), an important commercial and recreational species of fish in Hawaii, was investigated to obtain information on maturation and spawning, feeding habits, growth, migration, and mortality. The commercial akule catch statistics from 1948 to 1970 were examined to provide information on exploitation. Gonads were predominantly mature or spent during April through November suggesting that most akule spawn during this period. Crustacea and small fish were the principle foods. The monthly mortality rate estimated from tag recoveries was 66.3% and the annual mortality rate was 99.3%. The commercial net fishery produces nearly 70%

of the state's akule landings while the handline fishery accoounts for about 30%. Present regulatory measures appear to be adequate as the annual commercial akule landings seem to be maintaining itself at a relatively high level of 800,000 pounds or more. (Modified author abstract)

COM-73-11752/5GA Reprint
Skidaway Inst. of Oceanography, Savannah, Ga.
OBSERVATIONS OF FIN USE IN RELATION TO FEEDING AND RESTING BEHAVIOR IN FLATFISHES (PLEURONECTIFORMES),
Robert R. Stockney, David B. White, and David Miller. 1973, 5p NOAA-73100216
Contract NOAA-1-36009
Pub. in Copeia, n1 p154-156, 5 Mar 73.

Descriptors: (*Flatfishes, Animal behavior), Aquaculture, Motion, Feeding habits, Diet.
Identifiers: Sea Grant program, Pseuronectiformes.

To determine the feasibility of rearing flounders of the family Bothidae under aquaculture conditions, a group of ocellated flounders Ancyclopsetta quadrocellata Gill were kept under captive conditions. This note reports briefly on fin use in relation to feeding and resting behavior in flatfishes. The behavior of flatfishes with regard to head-propping and directional orientation while resting or swimming, is directly related to the 'side living' habit of the group. In the majority of fishes, directional change in the horizontal plane is under the control of the vertically oriented fins, dorsal, anal, and caudal, while directional change in the vertical plane is determined by the pectorals. In the Pleuronectiformes, because of the 90 degrees rotation in living position, the functions of these fins are reversed. Thus horizontal direction is controlled by the pectorals and vertical direction by the dorsal, ventral, and caudal fins. As a consequence, while flatfishes can change direction in the vertical direction efficiently they are quite inefficient in dealing with abrupt lateral direction changes, particularly at higher swimming speeds. (Author)

COM-73-11754/1GA PC$4.00/MF$1.45
Hawaii State Dept. of Land and Natural Resources, Honolulu.
COMMERCIAL OYSTER FISHERY DEVELOPMENT INVESTIGATION.
Completion rept. Jun 66-Jun 72,
Paul Y. Kawamoto, and Henry M. Sakuda. May 73, 38p NOAA-73090614

Descriptors: (*Oysters, Aquaculture), (*Hawaii, Fisheries), Abundance, Seafood, Management, Quality.
Identifiers: Crassostrea virginica, Pearl Harbor, Commercial fishing.

The Division of Fish and Game of the Department of Land and Natural Resources studied the biology of American oysters (Crassostrea virginica) in Hawaii to develop methods for their culture on a commercial basis. In 1962, there were 19 major oyster beds in West Loch, Pearl Harbor containing approximately 36 million live oysters equivalent to about 56 thousand bushels. A re-survey of these beds in 1971 revealed an estimated three percent decrease in the number of live oysters, but the larger sizes of oysters at this time resulted in a 127% increase in the estimated number of bushels of oysters. Oysters from West Loch increased from a sub-commercial quality to a commercially acceptable condition in three weeks utilizing an artificial feeding technique. (Modified author abstract)

COM-73-11755/8GA PC$4.50/MF$1.45
Washington State Dept. of Fisheries, Olympia. Research Div.
PINK AND CHUM SALMON INVESTIGATIONS--1967.
Progress rept.,
Ray C. Johnson, Robert Gerke, David Heiser, Russell Orrell, and Jack Olds. Oct 68, 50p NOAA-73092003
Contract DI-14-17-0007-692, Grant NMFS-1-40-R-1
Report on Puget Sound Stream Studies.

Descriptors: (*Salmon, Abundance), Puget Sound, ESTUARIES, Sampling, Marking.
Identifiers: Pink salmon, Chum salmon.

Puget Sound chum salmon runs in past years have been characterized by wide fluctuations in abundance. Proper fishery management has often been difficult due to the uncertainty of run size. Since it is desired to harvest the maximum number of the fish, leaving sufficient seed stock, the need for an accurate method of run size prediction may be clearly seen. The goal sought in the study is that of isolating valid relationships between data representing a relative index of juvenile abundance and the magnitude of the returning adult run. The dual objectives of the 1967 pink salmon escapement studies were preliminary estimates of escapement during the early portion of the runs which in part were used to formulate emergency management regulations, and an assessment of the total Puget Sound pink salmon escapement by river system.

COM-73-11761/6GA Reprint
National Marine Fisheries Service, Oxford, Md. Middle Atlantic Coastal Fisheries Center.
PREY PREFERENCE OF 'STYLOCHUS ELLIPTICUS' IN CHESAPEAKE BAY,
Darryl J. Christensen. 1973, 8p NOAA-73092506
Pub. in Proceeings of the National Shellfisheries Association, v63 p35-38 Jun 73.

Descriptors: (*Platyhelminthes, Feeding habits), (*Oysters, Animal ecology), Barnacles, Mortality, Estuaries, Chesapeake Bay.
Identifiers: Stylochus ellipticus, Predation.

Flatworms, Stylochus ellipticus, collected from two locations in Chesapeake Bay and randomly offered oysters and barnacles exhibited similar feeding behavior, preying on both species. However, when the flatworms were segregated, based on known prey at the time of collection, they exhibited marked prey preference. These experiments support the hypothesis of 'ingestive conditioning' in S. ellipticus as proposed by other investigators. (Author)

COM-73-11762/4GA Reprint
National Marine Fisheries Service, Oxford, Md. Middle Atlantic Coastal Fisheries Center.
'LABYRINTHOMYXA'-LIKE ORGANISMS ASSOCIATED WITH MASS MORTALITIES OF OYSTERS, 'CROSSOSTREA VIRGINICA,' FROM HAWAII,
Frederick G. Kern, Cecelia Sullivan, and Michio Takata. 1973, 8p NOAA-73092507
Prepared in cooperation with Hawaii Div. of Fish and Game, Honolulu.
Pub. in Proceedings of the National Shellfisheries Association, v63 p43-46 Jun 73.

Descriptors: (*Oysters, Fungus diseases), Parasites, Mortality, Histology, Pathology, Hawaii.
Identifiers: Crassostrea Virginica, Dermocystidium marinum, Pearl Harbor.

In July 1972, a massive mortality ravaged oyster stocks (Crassostrea virginica) in West Loch, Pearl Harbor, Hawaii. Oyster tissues cultured in fluid thioglycollate medium were found to be infected with a fungal parasite simular to Labyrinthomyxa marina (=Dermocystidium marinum). Examination of histological sections revealed hypnospore stages which had enlarged, formed presporangia and were believed to be forming planonts of developing zoospores. (Author)

COM-73-11763/2GA Reprint
National Marine Fisheries Service, Pascagoula, Miss. Southeast Fisheries Center.
THE EFFICACY OF MIDWATER ARTIFICIAL STRUCTURES FOR ATTRACTING PELAGIC SPORT FISH,
Donald A. Wickham, John W. Watson, Jr., and Larry H. Ogren. 1973, 12p Contrib-236 NOAA-73092717
Prepared in cooperation with Gulf Coastal Fisheries Center, Panama City, Fla.
Pub. in Transactions of the American Fisheries Society, v102 n3 p563-572 Jul 73.

Descriptors: (*Fishes, Animal behavior), (*Fishing, Mexico Gulf), Recreation, Underwater structures, Pelagic zone, Sampling, Effectiveness, Feasibility, Statistical analysis.
Identifiers: Sport fishing.

Field experiments were conducted in the northeastern Gulf of Mexico off Panama City, Florida to evaluate the feasibility of using man-made structures for attracting pelagic game fish to improve sportfishing catch rates. Significantly greater catches of little tunny (Euthynnus alleteratus), king mackerel (Scomberomorus cavalla), and dolphin (Coryphaena hippurus) were made around experimental structure sites than in adjacent control areas when equal experimental fishing effort was used. Multiple structures attracted larger numbers of coastal pelagic bait fish and produced larger catches of pelagic game fish than single-structure units. The distance offshore or water depth of structure locations affected both the species of fish attracted and the number of fish caught. (Modified author abstract)

COM-73-11767/3GA Reprint
National Marine Fisheries Service, Highlands, N.J. Middle Atlantic Coastal Fisheries Center.
A MARINE KILL IN NEW JERSEY COASTAL WATERS,
J. S. Young. 1973, 2p NOAA-73092718
Pub. in Marine Pollution Bull., v4 n5 p70 May 73.

Descriptors: (*Lobsters, Mortality), Coasts, Water pollution, Biochemical oxygen demand, Temperature, Dissolved gases, Oxygen, New Jersey.
Identifiers: Homarus americanus.

A kill of lobsters around wrecks off the New Jersey coast seem not to be a direct result of pollution but may have been due to an influx of water causing reduced oxygen levels combined with high temperatures. Mortalities of this kind have been observed before in the area but it is not known if this is an annual event or due to abnormal circumstances. It would be worth keeping the situation under review in the future. (Author)

COM-73-11768/1GA Reprint
National Marine Fisheries Service, Milford, Conn. Biological Lab.
THE EFFECTS OF SOME SELECTED BACTERIA ON EMBRYOS AND LARVAE OF THE AMERICAN OYSTER, 'CRASSOSTREA VIRGINICA',
Carolyn Brown. 8 May 72, 10p NOAA-73092719
Pub. in Jnl. of Invertebrate Pathology, v21 n3 p215-223 May 73.

Descriptors: (*Oysters, Growth abnormalities), (*Bacteria, Oysters), Embryos, Larvae, Shellfish, Pseudomonas, Mortality, Toxins and antitoxins.
Identifiers: Crassostrea virginica.

An investigation was conducted to determine the effects of selected bacteria on healthy embryos and larvae of the American oyster, Crassostrea virginica. A total of 156 bacterial types were isolated from moribund larvae and particulate matter collected with a 36 micrometers Nitrex screen. Most of the isolates were nonpigmented motile, gram-negative rods sensitive to chloramphenicol and neomycin, and were classified as Pseu-

domonas and Vibrio. Three oyster developmental stages were exposed to selected bacteria: embryos in the first 48 hr of development, 2-day-old larvae, and presetting, 10-day-old larvae. Twenty of the bacterial strains tested caused gross morphological abnormalities, decreased growth, and/or increased mortality for one or more of the three developmental stages. Neither culture filtrate nor heat-killed bacteria produced these effects. (Author)

COM-73-11772/3GA Reprint
National Marine Fisheries Service, Beaufort, N.C. Atlantic Estuarine Fisheries Center.
REEF FISHING ON THE CAROLINA CONTINENTAL SHELF,
Glenn B. Sekavec, and Gene R. Huntsman. 1972, 13p NOAA-73092720
Pub. in Proceedings of Annual International Game Fish Research Conference (15th) Miami Beach, Fla., Dec 72, p76-86.

Descriptors: (*Marine fishes, Continental shelves), Reefs, Fishing, Recreation, Identifying, Fisheries, Fishing grounds.
Identifiers: Sport fishing, Groupers, Snappers, Porgies, Grunts.

The outer one-third of the continental shelf from Cape Hatteras, N.C., southward harbors large populations of bottom fishes typical of Caribbean and Bahamian reefs and banks. These fishes--grouper, snappers, porgies and grunts--form the basis of a popular and productive sportfishery. Little interest was displayed by either scientists of fishermen in the fishes of the outer shelf area until the last two decades. Personnel of the S.C. Marine Resources Agency have also conducted exploratory fishing operations on the Carolina shelf and obtained some valuable information on species and sizes of fishes available.

COM-73-11779/8GA Reprint
National Marine Fisheries Service, Oxford, Md. Middle Atlantic Coastal Fisheries Center.
CARDIAC EDEMA ASSOCIATED WITH 'VIBRIO ANGUILLARUM' IN THE AMERICAN OYSTER,
Haskell S. Tubiash, Sara V. Otto, and Rudolph Hugh. 1973, 8p NOAA-73092505
Prepared in cooperation with Maryland Department of Natural Resources, Annapolis, and George Washington University, Washington, D.C. School of Medicine.
Pub. in Proceedings of the National Shellfisheries Association, v63 p39-42 Jun 73.

Descriptors: (*Oysters, Chesapeake Bay), (*Parasitic diseases, Oysters), (*Bacteria, Oysters), Invertebrates, Shellfish, Edema, Bays, Estuaries, Vibrio, Heart.
Identifiers: Crassostera virginica, Vibrio anguillarum.

During a survey for parasite distribution in Chesapeake Bay oysters (Crassostrea virginica), sporadic cases of greatly enlarged and edematous pericardia were noted. Prevalence of the edematous syndrome, which we have termed 'cardiac vibriosis', was estimated at 0.04%. Examination of aspetically aspirated pericardial fluid showed heavy concentrations of gram-negative motile rods which proved morphologically and culturally compatible with Vibrio anguillarum, an organism implicated in diseases of fishes and larval bivalve mollusks. Except for pericardial enlargement, the animals appeared to be grossly and histologically normal. Attempts to reproduce the pericardial edema experimentally by injection of V. anguillarum proved unsuccessful. (Author)

COM-73-11780/6GA Reprint
Maryland Fish and Wildlife Administration, Annapolis.
HERMAPHRODITISM IN THE SOFT CLAM 'MYA ARENARIA',
Sara V. Otto. 1972, 7p NOAA-73101015
Grant NMFS-3-131-R
Pub. in Proceedings of the National Shellfisheries Association, v62 p47-49 Jun 72.

Descriptors: (*Clams, *Hermaphroditism), Sampling, Histology, Chesapeake Bay.
Identifiers: Mya arenaria.

Four bilaterally and one mixed hermaphroditic soft shell clams (Mya arenaria) were found in samples collected in 1971 from Chesapeake Bay tributaries. The clams appeared to be normal in all other respects. It is believed that these are the only reported cases of hermaphroditism in Mya collected from the Chesapeake region. The prevalence of hermaphroditism was found to be 0.51%. (Author)

COM-73-11792/1GA PC$4.50/MF$1.45
Washington State Dept. of Fisheries, Olympia. Management and Research Div.
PINK AND CHUM SALMON PREDICTION STUDIES--1970.
Supplemental progress rept.,
Ray C. Johnson, Robert Gerke, David Heiser, and Stephen B. Mathews. Jan 71, 50p NOAA-73092006
Contract DI-14-17-0001-2206, Grant NMFS-1-54-R
Report on Puget Sound Stream Studies.

Descriptors: (*Salmon, Predictions), (*Puget Sound, Salmon), Abundance, Sampling, Forecasting.
Identifiers: Pink salmon, Chum salmon.

The report contains the following studies: Puget Sound pink salmon forecast for 1971: Hydraulic sampling technique; Puget Sound Chum Salmon forecast for 1971: Hydraulic sampling technique; Puget Sound Pink and Chum Salmon forecast for 1971:juvenile abundance technique; and environmental variability and Pink Salmon production.

COM-73-11794/7GA PC$3.50/MF$1.45
Texas A and M Univ., College Station. Dept. of Marine Resources Information.
NUTRITIONAL REQUIREMENTS OF BROWN SHRIMP, PENAEUS AZTECUS,
K. L. Shewbart, W. L. Mies, and P. D. Ludwig. Apr 73, 61p TAMU-SG-73-205 NOAA-73092602
Grant NOAA-043-158-18
Prepared by Chemical U.S.A., Lake Jackson, Texas. Ag-Organics Dept.

Descriptors: (*Shrimps, Animal nutrition), (*Aquaculture, Shrimps), Growth, Diets, Amino acids, Proteins, Carbohydrates.
Identifiers: Sea Grant program, Penaeus aztecus.

Basic research was conducted in important areas of shrimp nutrition in order to formulate an artificial shrimp diet which would maximize growth. The essential amino acids of shrimp were determined and the amino acids of protein quantitized. The fat content of shrimp was analyzed as triglycerides, free fatty acids, and phospholipids. Carbohydrates were determined quantitatively by gas-liquid chromatography. The mineral content of shrimp was determined. Using information gained from the above analyses, growth trials were performed varying the percentages protein, energy, and minerals. (Author)

COM-73-11805/1GA Reprint
National Marine Fisheries Service, Beaufort, N.C. Atlantic Estuarine Fisheries Research Center.
CONVERSION EFFICIENCY AND SURVIVAL OF YOUNG WINTER FLOUNDER 'PSEUDOPLEURONECTES AMERICANUS' UNDER EXPERIMENTAL CONDITIONS,
David W. Frame. 1973, 6p NOAA-73092511
Also pub. as Massachusetts Cooperative Fishery Unit, Amherst, Contrib-37.
Pub. in Transactions of the American Fisheries Society, v102 n3 p614-617 Jul 73.

Descriptors: (*Marine fishes, Growth), (*Aquaculture, Marine fishes), Temperature, Salinity, Diets, Animal nutrition, Food consumption.
Identifiers: Pseudopleuronectes americanus.

Age I winter flounder, Pseudopleuronectes americanus, weighing 40-100 g were fed chopped bivalve siphons (Mya arenaria) ad libitum. Sixteen fish were held at four temperatures (12, 16, 20 and 24C) and two salinities (20 and 30 parts per thousand), with two fish per regime. Only 4 fish held at 12C and 16C in 20 parts per thousand salinity had a normal growth rate, and the conversion efficiency for these fish ranged from 13.9 - 19.0%. (Author)

COM-73-11808/5GA Reprint
Louisiana State Univ., Baton Rouge. Dept of Food Science.
BINDERS AND PELLET STABILITY IN DEVELOPMENT OF CRUSTACEAN DIETS,
Sanuel P. Meyers, and Zoula P. Zein-Eldin. 1972, 16p NOAA-73100105
Contract NOAA-2-35231
Also pub. as National Marine Fisheries Service, Galveston, Tex. Biological Lab. Contrib-346.
Pub. in Proceddings of Annual Workshop, World Mariculture Society (3rd), St. Petersburg, Fla., 26-28 Jan 72, p351-364.

Descriptors: (*Crustacea, Diets), Shrimps, Invertebrates, Feeding habits, Feeding stuffs, Alginates, Aquaculture.
Identifiers: Sea Grant program, Prawns.

Diets developed for shrimps and prawns require good stability to avoid disintegration from exposure to water and from the manipulation process of the animal during ingestion. Other important considerations in selection of a proper binder include its digestability by the animal and its effect on the textural characteristics of the extruded pellet. Changes in texture may significantly affect acceptability of the food. Alginates have proven to be effective binders, giving adequate pellet stability for up to 48 hours. Binding properties are affected by type and concentration of alginate used, composition of the diet, and presence and levels of sequestrants. Ceral fillers, providing large areas of gelatinized starch, also insure good stability under proper processing conditions. Starch gelatinization is affected by particle size as well as the moisture, time, and temperature of the processing procedure. Pregelatinized starches have particular application in imparting desirable stability properties. Ultimate choice may depend upon cost of the binder and its adaptability to large-scale commercial operations. (Author)

COM-73-11809/3GA Reprint
National Marine Fisheries Service, Galveston, Tex. Biological Lab.
GROWTH OF HATCHERY-REARED 'PENAEUS AZTECUS' ON EXPERIMENTAL DIETS,
D. Grajcer, and R. Neal. 1972, 12p Contrib-345 NOAA-73100106
Pub. in Proceedings of Annual Workshop, World Mariculture Society (3rd), St. Petersburg, Fla., 26-28 Jan 72, p461-470.

Descriptors: (*Shrimps, Diets), Animal nutrition, Growth, Maturation, Aquaculture.
Identifiers: Penaeus aztecus.

During experimentation designed to determine the requirements for sexual maturation of brown shrimp (Penaeus aztecus) a series of diets were tested on juvenile and subadult shrimp. These diets were formulated from a series of compounds expected to provide the essential nutrients for growth and sexual maturation. Both natural and prepared foods (i.e., foods which have been processed for storage at room temperature) were tested. The ingredients of the foods tested and the processing methods used to stabilize the foods are described. Growth rates and amounts of food consumed for shrimp reared on these diets are discussed, and growth is compared with that observed for wild shrimp. Implications of these growth rates to shrimp cultures are discussed. Experimental stunting of junvile shrimp was in-

vestigated as a means of storing excess animals temporarily. (Author)

COM-73-11810/1GA Reprint
National Marine Fisheries Service, Washington, D.C. Systematics Lab.
'DAECTOR QUADRIZONATUS', A VALID SPECIES OF FRESHWATER VENOMOUS TOADFISH FROM THE RIO TRUANDO, COLOMBIA WITH NOTES ON ADDITONAL MATERIAL OF OTHER SPECIES OF DAECTOR,
Bruce B. Collette. 1973, 4p NOAA-73100409
Pub. in Copeia, n2 p355-357, 22 May 73.

Descriptors: (*Fresh water fishes, *Truando River), Colombia, Taxonomy, Identifying.
Identifiers: Daector quadrizonatus, Daector schmitti, Daector dowi, Daector reticulatus.

The note identifies Daector quadrizonatus as a valid species of freshwater venomous toadfish from the Rio Truando, Columbia. Additional material received by the author identifies three other species of Daector: Daector schmitti; Daector reticulatus; and Daector dowi.

COM-73-11811/9GA PC$6.75/MF$1.45
Washington State Dept. of Fisheries, Olympia. Management and Research Div.
PINK AND CHUM SALMON INVESTIGATIONS--1969.
Supplemental progress rept.,
Ray C. Johnson, Robert J. Gerke, David W. Heiser, Russel F. Orrell, and Stephen B. Mathews. Jun 71, 92p NOAA-73092004
Grant NMFS-1-40-R
Report on Puget Sound Stream Studies.

Descriptors: (*Salmon, Fisheries), (*Puget Sound, Salmon), Estuaries, Survival, Reproduction(Biology), Growth, Mortality, Washington(State).
Identifiers: Pink salmon, Chum salmon.

The report consists of the following nine studies: Assessment of pre-emergent Chum Salmon survival in Puget Sound and Hood Canal streams; Estuarial studies; Puget Sound juvenile Chum Salmon observations; Environmental effect on Pink Salmon run size; Use of a sonar counter to enumerate adult salmon; Spawning depths and velocities of Chum and Pink Salmon in Western Washington; The 1969 Pink Salmon escapement in Puget Sound; Puget Sound Chum Salmon escapement, 1969; Spawning gravel improvement techniques tested on Western Washington streams, 1969-1970; and Review of some potential effects of temperature changes on juvenile salmon.

COM-73-11813/5GA PC$4.25/MF$1.45
Washington State Dept. of Fisheries, Olympia.
THE 1971 LAKE WASHINGTON SOCKEYE SALMON TAGGING STUDY.
Completion rept. Jun 71-Jun 72,
David C. Pratt, and Earle D. Jewell. Feb 73, 41p NOAA-73090613

Descriptors: (*Salmon, Animal migrations), Marking, Fisheries, Discovery Bay, Cedar River, Lake Washington, Puget Sound.
Identifiers: Oncorhynchus nerka.

During June and July of 1971, 3709 sockeye salmon (Oncorhynchus nerka) were tagged in the area from Discovery Bay to Seattle, Washington. Sport, commercial , and Indian fisherics returned 1120 tags, while spawning migration observations at a weir and counting tower on the Cedar River and spawning ground surveys provided sufficient information to estimate the timing and destination of an additional 1486 tagged sockeye. Tagging was carried out to gain additional information on the speed of migration, commercial harvest rates, migration routes, and the timing of various spawning segments of Lake Washington sockeye migrating through lower Puget Sound. Migration rates were found to be rapid with sockeye requiring only 3.8 days to migrate from Discovery Bay through the Seattle area fishery. Despite rapid travel rates, sockeye were found to be highly susceptible to harvest with harvest rates, at least on some occasions, exceeding 80%. Tagging failed to demonstrate a significant difference in timing through marine waters between various spawning segments of the Lake Washington sockeye run. (Author)

COM-73-11814/3GA PC$4.25/MF$1.45
Alaska Dept. of Fish and Game, Juneau.
PINK SALMON FORECAST RESEARCH.
Completion rept. Jul 65-Jun 69,
Michael J. McHugh. Jun 68, 44p NOAA-73092002
Grant NMFS-5-4-R

Descriptors: (*Salmon, Sampling), (*Alaska, Salmon), Mortality, Forecasting, Abundance, Temperature measurement, Salinity.
Identifiers: Pink salmon, Tow net sampling.

The practical logistics and reduced costs associated with putting sampling crews in the field makes prediction of adult returns from pre-emergent fry sampling much more desirable than estuarine prediction of pink salmon. A study was made to determine the feasibility of adapting the tow-netting technique for capturing estuarine salmon fry in Southeastern Alaska to arrive at either: (1) A mortality correction factor to apply to forecasts of adult return based on pre-emergent fry estimates; or (2) an index of abundance upon which an independent forecast could be based. A secondary objective in the study was to record temperature and salinity data in conjunction with fingerling catch, attempting to observe any correlation between these environmental conditions and fingerling distribution.

COM-73-11822/6GA Reprint
National Marine Fisheries Service, Washington, D.C. Systematics Lab.
ENDANGERED WILDLIFE,
Bruce B. Collette, and F. Wayne King. 1973, 4p NOAA-73100410
Prepared in cooperation with New York Zoological Society, Bronx.
Pub. in Copeia, n2 p390-392, 22 May 73.

Descriptors: (*Wildlife, *Conservation), (*International trade, Wildlife), Fishes, Amphibians, Reptiles, Birds, Mammals, Mollusca, Insects, Regulations.
Identifiers: *Endangered species.

The report provides a table of the number of taxa of different groups of animals to be regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Trade in specimens of these species requires an export permit which will be granted only when a designated Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of the species. An import permit is also required for entry into the recipient state.

COM-73-11824/2GA PC$3.00/MF$1.45
Oregon Fish Commission, Portland.
SALMON AND STEELHEAD MARK PROCESSING CENTER.
Completion rept. Jul 70-Jun 73,
Louis C. Fredd. Jul 73, 6p NOAA-73090615

Descriptors: (*Fisheries, Data processing), Salmon, Marine fishes, Marking, Sampling, California, Oregon, Washington(State), Coasts.
Identifiers: Anadromous fish, Steelhead.

During the contract period FY 1971-73, the Biometrics Section of the Fish Commission of Oregon continued operating a Mark Processing Center for coordinating the reporting of salmon and steelhead catch and finmark sampling data for the states of California, Oregon, and Washington. This information was assembled by the Mark Processing Center into annual data reports.

COM-73-11825/9GA PC$3.00/MF$1.45
Washington State Dept. of Fisheries, Olympia.
HATCHERY CHINOOK SALMON CONTRIBUTION TO THE FISHERY.
Completion rept. Jul 71-Jun 73,
Peter K. Bergman. Jul 73, 11p NOAA-73092105

Descriptors: (*Salmon, Marking), Fisheries, Puget Sound, Washington(State).
Identifiers: Chinook salmon, Sport fishing, Commercial fishing.

The project was intended to determine how hatchery stocks of chinook salmon in Puget Sound and the coast of Washington state contribute to the sport and commercial fisheries of the U.S. and Canada. This report discusses the stocks that were marked, the numbers marked in each group, and the purposes of the studies. The recoveries of the coded wire tags, the analyses of the recoveries, and the final impacts--the alteration of hatchery procedures with increased benefit--are covered under separate projects and thus are considered separately. Also, most of the recovery and analysis have not occurred because some fish will contribute to the fisheries for as long as five or six years after tagging.

COM-73-11828/3GA PC$3.00/MF$1.45
Oregon Fish Commission, Portland.
REAR AND RELEASE SALMONIDS AT THE ELK RIVER SALMON HATCHERY.
Completion rept. Jul 70-Jun 73,
Ernest R. Jeffries. Jul 73, 5p NOAA-73092108

Descriptors: (*Salmon, Aquaculture), Aquaculture, Growth, Reproduction(Biology), Benefit cost analysis, Statistical data, Elk River, Oregon.

The Elk River Salmon Hatchery's primary function has been to produce fall chinook. Production records for the species of fish reared since 1968 are presented. It is estimated that 10,000 hatchery-reared fall chinook returned to Elk River in 1972. The fall chinook from this hatchery contributed to the ocean sport and commercial catch from the mouth of the Columbia River to mid California. Preliminary benefit-cost ratio studies show a $2.00 return for each $1.00 invested in facilities and operation of this hatchery.

COM-73-11829/1GA PC$3.25/MF$1.45
Washington Univ., Seattle. Fisheries Research Inst.
MEASUREMENT OF SPAWNING SUCCESS AND FRY QUALITY OF CHUM SALMON UTILIZING NATURAL AND CONTROLLED SPAWNING AREAS AT BIG BEEF CREEK, WASHINGTON.
Completion rept. Jul 67-Jun 70,
K. V. Koski. Sep 70, 21p NOAA-73092107

Descriptors: (*Salmon, Reproduction(Bioloy)), Washingtn(State) GROWTH, Animal ecoogy, Survival, Aquaculture.
Identifiers: Oncorhynchus keta.

The report is a compilation of three annual progress reports July 1967 to June 1968, July 1968 to June 1969 and July 1969 to June 1970. The study of the spawning of chum salmon (Oncorhynchus keta) at the University of Washington's Big Beef Creek Fish Research Station located on Hood Canal, Washington, is in its third year of investigation. Two spawning channels were constructed so that ecological factors affecting salmonid spawning success could be manipulated. Weight, length and age of each adult salmon placed in the channels are recorded and the fish are identified by a numbered tag. Spawning behavior, including the elapsed time between arrival and spawning

success are measured. Calculated fecundities are used to determine the potential egg deposition of each individual.

COM-73-11831/7GA PC$5.75/MF$1.45
Washington State Dept. of Fisheries, Olympia. Management and Research Div.
PINK AND CHUM SALMON INVESTIGATIONS - 1968.
Progress rept.,
Ray C. Johnson, David Heiser, Robert Gerke, and Stephen B. Mathews. Sep 70, 73p NOAA-73092005
Contract DI-14-17-0007-692, Grant NMFS-1-40-R-2
Report on Puget Sound Stream Studies.

Descriptors: (*Salmon, Abundance), Washington(State), Fisheries, Sampling, Counters, Puget Sound, Cedar River.
Identifiers: Pink salmon, Chum salmon, Commercial fishing.

Included are reports on the following investigations: Juvenile pink and chum salmon population studies; gravel compaction and composition study; results of field testing a sonar salmon counter in the Cedar River; and Puget Sound chum salmon catches and escapement based on 1968 tagging.

COM-73-11835/8GA PC$4.75/MF$1.45
Washington State Dept. of Fisheries, Olympia. Management and Research Div.
PINK AND CHUM SALMON PREDICTION STUDIES, 1971.
Supplemental progress rept.,
Ray C. Johnson, David W. Heiser, Robert J. Gerke, and Stephen B. Mathews. Mar 72, 55p NOAA-73092007
Contract DI-13-17-0001-2425, Grant NMFS-1-54-R
Report on Puget Sound Stream Studies.

Descriptors: (*Salmon, Forecasting), (*Puget Sound, Salmon), Sampling, Abundance, Stream flow, Estuaries, Temperature.
Identifiers: Chum salmon, Pink salmon.

The issue consists of the following reports: Puget Sound Pink Salmon forecast for 1971, hydraulic sampling technique; Puget Sound Chum Salmon forecast for 1972, hydraulic sampling technique; Puget Sound Pink Salmon forecast for 1971, juvenile abusdance technique; Chum prediction study, junenile abundance technique; environmental variability and Pink Salmon production; and relationship of stream flow and estuarial temperature to Chum Salmon returns.

COM-73-11836/6GA PC$4.25/MF$1.45
Washington State Dept. of Fisheries, Olympia.
PUGET SOUND BAITFISH STUDIES.
Completion rept. Jul 71-Jun 73,
Alan E. Millikan. Jul 73, 44p NOAA-73090610
Grant NMFS-1-81-R

Descriptors: (*Fishes, Abundance), (*Puget Sound, Fisheries), Herrings, Resources, Marking, Acoustic detection, Sampling, Plankton, Biomass, Surveys.
Identifiers: Bait fish, Smelt.

Acoustic stock assessment surveys were conducted in several areas of greater Puget Sound to obtain herring abundance estimates. The biomass of herring in southern Puget Sound increased from 9.5 million pounds in January 1972 to 32.6 million pounds in January 1973. Estimates for most other areas are not complete. Spawning ground surveys were intensified in 1973 and several previously unreported areas were found. Over 44 lineal miles of spawning area were cataloged in 1972, and about 80 miles in 1973. Preliminary tagging studies were initiated during the past year. Tagged herring were held in pens to evaluate a small T-bar tag. About 15,000 tagged juvenile herring were released into Carr Inlet in February but none have yet been recovered. Several special projects, including a spawning ground enhancement study, plankton surveys, and a herring feeding experiment, are discussed. (Modified author abstract)

COM-73-11840/8GA Reprint
Rhode Island Univ., Kingston. Graduate School of Oceanography.
FATTY ACID COMPOSITION OF ORGANIC DETRITUS FROM 'SPARTINA ALTERNIFLORA',
David M. Schultz, and James G. Quinn. 1 Mar 73, 15p NOAA-73101104
Grant NOAA-043-158-3
Pub. in Estuarine and Coastal Marine Science, v1 p177-190 1973.

Descriptors: (*Grasses, Detritus), (*Detritus, Fatty acids), (*Rhode Island, Grasses), Swamps, Plants(Botany), Chemical analysis, Microorganisms, Organic wastes, Dissolved organic matter, Seasonal variations, Aerobic processes, Plant chemistry.
Identifiers: Spartina alterniflora, Sea Grant program, Salt marshes, Cordgrass.

The fatty acid composition and concentration of the marsh grass Spartina alterniflora were determined monthly on samples of stems and leaves collected from Bissel Cove, Narragansett Bay, R.I. Seasonal differences were found in both composition and concentration. The fatty acids present in suspended organic matter collected at the mouth of Bissel Cove during ebb and flood tide for the same period have also been analyzed. Laboratory model studies involving the formation of suspended organic matter by the decomposition of S. alterniflora have been investigated under aerobic and anaerobic conditions, using both organic solvent-extracted and non-extracted grass. Field model studies were also conducted using both extracted and non-extracted grass. The fatty acid composition and concentration of suspended organic matter formed in the various model studies were similar to those found in the natural material and differed markedly from that of S. alterniflora. The total fatty acid concentration and the branched chain acids appear to be the result of microbial activity and their high levels in the suspended organic matter, together with the fatty acid concentrations of the model studies using extracted marsh grass, indicate that micro-organisms are very important in the formation of the natural organic detritus.

COM-73-11842/4GA Reprint
Maryland Dept. of Natural Resources, Annapolis. Fisheries Administration.
HERMAPHRODITISM IN TWO SPECIES OF PELECYPOD MOLLUSKS.
1973, 8p NOAA-73101014
Grant NMFS-3-131-R
Pub. in Proceedings of the National Shellfisheries Association, v63 p96-98 Jun 73.

Descriptors: (*Mollusca, *Hermaphroditism), Clams, Histology, Pelecypoda, Invertebrates, Chesapeake Bay, Chincoteague Bay.
Identifiers: Mya arenaria, Mercenaria mercenaria.

Five additional hermaphroditic soft shell clams (Mya arenaria) were found in samples from several beds in Chesapeake Bay in 1971. With these new findings, a total of ten hermaphrodites, seven bilateral and three mixed, have been found among 1,311 specimens examined. These are the only known cases of soft clam hermaphroditism ever reported for Chesapeake Bay. One bilaterally hermaphroditic hard clam (Mercenaria mercenaria) was found from 546 examined in Chincoteague Bay. This is the first known case of hermaphroditism in hard clams in Chincoteague Bay. A total of 520 hard clams were also examined from Chesapeake Bay, but no hermaphrodites were found. (Author)

COM-73-11846/5GA PC$3.00/MF$1.45
Oregon Fish Commission, Portland.
REAR AND RELEASE SALMONIDS AT THE NORTH NEHALEM RIVER SALMON HATCHERY.
Completion rept. Jul 70-Jun 73,
Ernest R. Jeffries. Jul 73, 4p NOAA-73090616

Descriptors: (*Fishes, Aquaculture), (*Oregon, Fishes), Salmon, Fisheries, Benefit cost analysis.
Identifiers: North Nehalem River Salmon Hatchery, Coho salmon, Chinook salmon, Steelhead.

The purpose of this project was to increase production of salmon and steelhead which in turn would increase the numbers of fish available to sport and commerical fisheries in the ocean, bay and river. This hatchery was constructed with no barrier in the stream allowing the adult salmon to move into the collection facility at their own choice. The adult count is a minimum estimate of those returning to the stream. The collection facility is closed for steelhead to make all returning adults available to the fishery. All steelhead and fall chinook eggs are transferred in from other hatcheries. The construction of the six additional ponds provided sufficient rearing capacity to utilize the total streamflow during low flow periods. All facilities at this relatively new hatchery have worked well. A preliminary detailed study to determine benefit-cost ratios reveals that the coho, fall chinook and steelhead produced from this hatchery contribute to the sport and commercial fisheries in the ocean, bay and river at a rate between $3 and $4 for each dollar expended in construction and operation.

COM-73-11849/9GA PC$3.00/MF$1.45
Oregon Fish Commission, Portland.
REAR AND RELEASE SALMONIDS AT THE TRASK RIVER REARING POND.
Completion rept. Jul 70-Jun 73,
Ernest R. Jeffries. Jul 73, 3p NOAA-73090612

Descriptors: (*Salmon, Statistical data), Trask River, Aquaculture, Ponds, Oregon.
Identifiers: Coho salmon.

The report provides a table showing the production of coho salmon from 1969-1972. Data are given on the number stocked, fingerlings transferred, smolts released, fish per pound and pounds produced.

CONF-730623-2/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn. Yale Univ., New Haven, Conn. (Usa). Dept. Of Biology.
ULTRASTRUCTURE OF ACTIVE EUKARYOTIC GENOMES.
B. A. Hamkalo, O. L. Jr. Miller, and A. H. Bakken. 1973, 16p

Descriptors: (*Chromosomes, *Molecular structure), Chromatin, Drosophila, Electron microscopy, Embryos, Genes, Hela cells, Nucleoproteins, Ribosomes, Rna, Yeasts.

For abstract, see NSA 28 07, number 17738.

COO-1332-60/GA PC$3.75/MF$1.45
WINTER ACTIVITY OF STRIPED SKUNKS (MEPHITIS MEPHITIS) IN EAST-CENTRAL MINNESOTA.
M. E. Sunquist. 1972, 31p

Descriptors: (*Wild animals, *Behavior), Mammals, Minnesota, Seasonal variations, Terrestrial ecosystems.

For abstract, see NSA 28 07, number 17745.

COO-1332-70/GA PC$11.25/MF$1.45
Minnesota Univ., St. Paul.

SPRING DRUMMING ACTIVITY AND SPACE USE OF RUFFED GROUSE.
H. L. Archibald. Mar 73, 183p

Descriptors: (*Birds, *Behavior), Seasonal variations.

For abstract, see NSA 28 07, number 17746.

COO-1332-93/GA PC$9.00/MF$1.45
Minnesota Univ., Minneapolis.
COMMUNICATION IN RED FOX DYADS: A COMPUTER SIMULATION STUDY.
G. G. Montgomery. Jun 73, 140p
Contract AT(11-1)-1332

Descriptors: (*Wild animals, *Communications), Mammals, Terrestrial ecosystems.

For abstract, see NSA 28 07, number 17748.

COO-3010-10/GA PC$3.00/MF$1.45
Harvard Univ., Boston, Mass.
CHARACTERIZATION OF BIOLOGICAL MEMBRANES BY PHYSICAL CHEMICAL METHODS. PROGRESS REPORT, JULY 1, 1972--MAY 30, 1973.
A. K. Solomon. 1973, 8p
Contract AT(11-1)-3010

Descriptors: (*Cell membranes, *Physical properties), Chemical properties, Computer codes, Diffusion, Electrolytes, Permeability, Physical chemistry.

For abstract, see NSA 28 07, number 17751.

JPRS-60251/GA PC$2.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
TRANSLATIONS FROM PRIRODA. NUMBER 6, 1973,
G. I. Polrovskii, V. B. Kudrin, E. K. Eskov, and S. A. Ostroumov. 11 Oct 73, 19p
Trans. of Priroda (USSR) n6 p97-99, 102-104, 115-116 1973.

Descriptors: (*Exobiology, USSR), (*Biology, USSR), Extraterrestrial radio waves, Gravity, Communicating, Celestial bodies, Formicidae, Acoustic signals, Biochemistry, Metabolism, Humans, Translations.
Identifiers: Bioenergetics.

Contents:
Two objects suggested in search for extraterrestrial populations;
Gravitational waves proposed for communication with other worlds;
Distress and alarm signals of ants studied;
New book sums up latest developments in bioenergetics.

LA-UR-73-820/GA PC$4.50/MF$1.45
Los Alamos Scientific Lab., N. Mex.
NATURE OF HETEROPLOIDY.
P. M. Kraemer, L. L. Deaven, H. A. Crissman, J. A. Steinkamp, and D. F. Petersen. 1973, 47p
CONF-730623-1
Contract W-7405-eng-36

Descriptors: (*Ploidy, *Reviews), Cell cultures, Chromosomes, Dna, Hela cells, Karyotype.

For abstract, see NSA 28 07, number 17776.

N73-30988/2GA PC$8.50/MF$1.45
Texas A&M Univ., College Station. Dept. of Plant Sciences.
ANALYTICAL AND RADIO-HISTO-CHEMICAL EXPERIMENTS OF PLANTS AND TISSUE CULTURE CELLS TREATED WITH LUNAR AND TERRESTRIAL MATERIALS.
Final Report.
R. S. Halliwell. 1973, 127p NASA-CR-134036, BB321-55-407P
Contract NAS9-12050

Descriptors: *Growth, *Lunar soil, *Minerals, *Plants (Botany), *Simulation, Apollo project, Neutron activation analysis, Planetary quarantine.

For abstract, see STAR 1122

N73-31000/5GA PC$4.00/MF$1.45
Montana Univ., Missoula.
TELEMETRY EXPERIMENTS WITH A HIBERNATING BLACK BEAR.
Progress Report.
J. J. Craighead, J. R. Varney, J. S. Sumner, and F. C. Craighead, Jr.. 30 Jun 72, 36p NASA-CR-133926
Contract NGR-27-002-006

Descriptors: *Biotelemetry, *Mammals, Body temperature, Physiology, Sleep.

For abstract, see STAR 1122

PATENT-3 524 276/GA Not available NTIS
Department of the Navy Washington D C
ELIMINATION OF JELLYFISH AND THE LIKE.
Patent,
Edward V. Thomas, and Bruce E. Douglas. Filed 26 Jan 68, patented 18 Aug 70, 3p Rept nos. PAT-APPL-700 991,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D. C. 20231 $0.50.

Descriptors: (*Sonar projectors, *Patents), Invertebrates, Very low frequency, Mortality rates, Chesapeake Bay.
Identifiers: PAT-CL-43-4-5, Coelenterata, Jellyfish.

The method concerns a method whereby Sea creatures of the genus Medusa (sea nettles, jellyfish) are driven to the surface of water by exposure to acoustic waves at frequencies from about 2 to about 3.2 kilohertz. The creatures may then be identified and gathered by net, centrifugal separators, or other means, and disposed of.

PB-224 510/8GA PC$3.50/MF$1.45
Bermuda Biological Station for Research, St. George's West.
IDENTIFICATION MANUAL TO THE PELAGIC SARGASSUM FAUNA.
Special publication,
Byron F. Morris, and Deborah D. Mogelberg. Jun 73, 64p* SP-11 NSF/IDOE-73-40
Grant NSF-GX-32883

Descriptors: (*Aquatic animals, Identifying), Substrates, Manuals, Pelagic zone, Hydroids, Invertebrates, Shellfish, Coelenterata, Platyhelminthes, Sargasso Sea, Annelida, Arthropoda, Mollusca, Bryozoa, Tunicata, Marine fishes, Taxonomy, Algae.
Identifiers: IDOE (International Decade of Ocean Exploration), International decade of ocean exploration, Tardigrada, Ectoprocta.

As part of a grant from the National Science Foundation's International Decade of Ocean Exploration, work began in May, 1972 at the Bermuda Biological Station to study Sargassum communities. As an initial task to facilitate the identification of the fauna, a literature search for records of species from pelagic Sargassum was conducted. It was attempted to make the search as thorough as possible within the time limits available. This manual is a result of this literature survey. A complete review of the Sargassum literature is beyond the scope of present purposes, and this manual is restricted to listing the fauna and their references, with descriptions and illustrations of the species to facilitate their identification.

PB-224 830/0GA PC-GPO/MF$1.45-NTIS
Purdue Univ., Lafayette, Ind. Dept. of Entomology.
BIOTA OF FRESHWATER ECOSYSTEMS. IDENTIFICATION MANUAL NO. 10. GENERA OF FRESHWATER NEMATODES (NEMATODA) OF EASTERN NORTH AMERICA.
Water pollution control research series,
V. R. Ferris, J. M. Ferris, and J. P. Tjepkema. Jan 73, 44p W74-00563, EPA-18050-ELD01/73
Contract DI-14-12-894
See also Identification Manual No. 9, PB-222 930.
Paper copy available from GPO $4.00 as EP1.16:18050ELD01/73.

Descriptors: (*Nematoda, Fresh water biology), Invertebrates, Aquatic animals, Taxonomy, Identifying, Collecting methods, Morphology, Ecology, Distribution(Property), Manuals, North America.
Identifiers: Ecosystems, Taxonomic keys.

An illustrated key to 56 genera of freshwater nematodes of eastern North America is given. Notes are included on the significance of nematodes in freshwater ecosystems, collecting and isolating nematodes, slide preparation and counting, and identification and use of the key.

PB-224 831/8GA PC-GPO/MF$1.45-NTIS
Purdue Univ., Lafayette, Ind. Dept. of Entomology.
BIOTA OF FRESHWATER ECOSYSTEMS. IDENTIFICATION MANUAL NO. 11. FRESHWATER UNIONACEAN CLAMS (MOLLUSCA:PELECYPODA) OF NORTH AMERICA.
Water pollution control research series,
J. B. Burch. Mar 73, 183p W74-00564, EPA-18050-ELD03/73
Contract DI-14-12-894
See also Identification Manual No. 10, PB-224 830.
Paper copy available from GPO $4.10 as stock no. 5501-00588.

Descriptors: (*Mollusca, Fresh water biology), Invertebrates, Mussels, Pelecypoda, Clams, Taxonomy, Anatomy, Distribution(Property), Identifying, Aquatic animals, Morphology, Ecology, Manuals, North America.
Identifiers: Unionacea, Ecosystems, Taxonomic keys.

Bivaled mollusks of the superfamily Unionacea (Order Schizodonta) are represented in North America by three families, 46 genera, and, as treated in this key, 221 species. The primitive Margaritiferidae are represented by two genera and four species, the Amblemidae by eight genera and 25 species, and the very large family Unionidae by 36 genera and 192 species. Systematics are not well worked out in many groups, which makes a definitive listing of species somewhat arbitrary at this time. The present key in most instances reflects a conservative approach to the lower taxa and, although it omits many nominal species of doubtful validity, the key nevertheless represents most of the biological species. Characters of soft anatomy are used to separate the families, subfamilies and, in a few cases, genera. Species are separated by shell characters. The main feature of this publication is an illustrated taxonomic key using both soft anatomy and shell characters for the identification of the North American Unionacea.

RT/BIO-(72)19/GA PC$3.50/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
INHERITANCE OF THE DURATION OF DEVELOPMENTAL PHASES OF THE BIOLOGICAL CYCLE OF TRITICUM DURUM DESF.
D. Bagnara, A. Bozzini, and G. T. Scarascia-Mugnozza. 29p
U.S. Sales Only.

Descriptors: (*Wheat, *Genetics), Agriculture, Genotype.

For abstract, see NSA 28 08, number 20637.

SRO-735-2/GA PC$4.25/MF$1.45
Georgia Univ., Athens. Dept. Of Zoology.
STUDIES ON MECHANISMS OF MUTATION, RECOMBINATION AND GENE ACTION IN NEUROSPORA. PROGRESS REPORT, OCTOBER 1, 1972--SEPTEMBER 30, 1973.
N. H. Giles. 30 Jun 73, 41p
Contract AT(38-1)-735

Descriptors: (*Neurospora, *Mutations), Biochemistry, Enzymes, Genes, Immunology, Metabolism, Proteins.

For abstract, see NSA 28 07, number 17815.

TT-71-56096/GA PC$5.25/MF$1.45
Smithsonian Institution, Washington, D.C.
BULLETIN OF THE NATURAL HISTORY MUSEUM IN BELGRADE. SERIES B. BIOLOGICAL SCIENCES. VOLUME 23, 1968.
1973, 193p
Trans. of Prirodnjacki Muzej Srpske Zemlje. Glasnik. Seriya B. Bioloske Nauke (Yugoslavia) v23 1968, by Ruzica Pavasovic, and Vojislav Pavasovic. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Biology, *Yugoslavia), Ecology, Plants(Botany), Orthoptera, Insects, Hymenoptera, Diptera, Entomology, Translations.
Identifiers: Laserpitium siler, Locusta migratoria, Dociostaurus macroccanus, Cerceris rybyensis, Pompilus viatus, Pompilius plumbeus, Systropha planidens, Halictus fulvipes.

Contents:
- Ecologic differentiation of floral complexes of macromycetes in conditions of formation of plant communities on the pastures of Deliblatski Pesak;
- New data on the finds of plant species in Serbia (II);
- The level of osmotic values and the amount of essential oil in Laserpitium siler L. as a function of various factors;
- On some rare and new plant species in the flora of Yugoslavia and Serbia from the Derdap Gorge Area;
- The Moroccan locust (D. Maroccanus Th.) and the migratory locust (L. migratoria L.) in Ulcinj District, Montenegro;
- Biological observations of some species of the genus Ceratina Latr. (Apoidea, Hymenoptera);
- Diptera taken in Yugoslavia from May to July, 1955, with localities and notes;
- Notes on the biology of the digger wasp Cerceris rybyensis L. (Sphegidae, Hymenoptera);
- Biological observations of Systropha planidens Gir. (Apoidea, Hymenoptera).

TT-72-51133/GA PC$3.75/MF$1.45
Agricultural Research Service, Washington, D.C.
NEW BIOLOGICAL ACTIVE SUBSTANCES FROM PLANTS OF MYRTACEAE FAMILY (NOVE BIOLOGICHESKI AKTIVNE VESHCHESTVA V RASTENIYAKH SEMEISTVA MIVTOVYKH),
A.P Degtyareva. 1973, 31p
Trans. from: Book commemorating scientific and practical activities of state Nikitsk Botanical Garden during 150 years 1812-1862, Moscow, 1964 p271-281. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Antiinfectives and antibacterials, *Plants(Botany)), (*Medicinal plants, Antiinfectives and antibacterials), (*Bactericides, Plants(Botany)), Antibiotics, Organic compounds, Bacteria, Oils, USSR, Translations.
Identifiers: *Myrtaceae, Myrtus communis, Eucalyptus laevopinea.

Maximum antibacterial activity was detected in Eucalyptus laevopinea, E. wilkinsoniana, and Myrtus communis. As a result of a study of different parts of the plant, the maximum antibacterial activity was found in leaves, and the minimum in the core. Practically no activity was detected in wood. Activity is also retained in dry and decayed fallen leaves. Physical and chemical properties of the organic compounds extracted from Eucalyptus and Myrtus are discussed. Data are presented on the antimicrobial properties of the extracted substances.

TT-72-51134/GA PC$3.50/MF$1.45
Agricultural Research Service, Washington, D.C.
ANTIMICROBIAL ACTION OF VOLATILE SUBSTANCES SECRETED INTO AIR BY ORNAMENTAL PLANTS IN THE PROCESS OF THEIR VITAL ACTIVITY (ANTIMIKROBNOE DEISTVIE LETUCHIKH VESHCHESTV VYDELYAEMYKH V VOZDUKH DEKORATIVNYMI RASTENIYAMI V PROTSESSE ZHIZNEDEYATELNOSTI),
A. S. Koverga. 1973, 27p
Trans. from: Book commemorating scientific and practical activities of state Nikitsk Botanical Garden during 150 years 1812-1962, Moscow, 1964 p214-224. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Antiinfectives and antibacterials, *Plants(Botany)), (*Bactericides, Plants(Botany)), (*Medicinal plants, Antiinfectives and antibacterials), Organic compounds, Vapors, Bacteria, Aerosols, Secretion, Translations, USSR.

TT-73-53039/GA PC$3.00/MF$1.45
Smithsonian Institution, Washington, D.C.
THE EVOLUTION OF POLLINATION IN ANGIOSPERMS IN THE LIGHT OF THE THEORY OF MUTUALLY ADAPTIVE PARALLEL EVOLUTION (EVOLYUTSIYA PCHELOPYLENIYA U POKRYTOSEMENNYICH V SVETE TEORII SOPRYAZHENNOI EVOLYUTSII),
N. N. Blugoveschenskaya. 1972, 9p
Trans. of Botanicheskii Zhurnal (USSR) v55 n9 p1301-1303 1970, by Geti Saad. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Pollen, Evolution(Development)), (*Plants(Botany), *Evolution(Development)), Fertility, Reproduction(Biology), Plant physiology, Translations, USSR.
Identifiers: *Pollination, *Angiosperms.

The ancient angiosperm plants had no specialized pollination. For cross-pollination wind, insects, birds, and mammals were used. Specialization of angiosperms to any particular agent of pollination, as a result of mutually adaptive evolution, appeared at considerably later stages of historical development. Therefore, entomophily and anemophily are equally secondary with respect to initial nonspecialized mode of pollination in angiosperm plants. A scheme of the distribution of modes of pollination is given.

6D. Bionics

AD-768 512/6GA Reprint
Hawaii Univ Honolulu Dept of Physics and Astronomy
UNGRAMMATICAL GRAMMAR IN PATTERN RECOGNITION,
Satosi Watanabe. 28 Oct 70, 26p AFOSR-TR-73-1777
Grant AF-AFOSR-1466-68
Availability: Pub. in Jnl. of Pattern Recognition, v3 p385-408 1971.

Descriptors: (*Pattern recognition, *Grammars), Phrase structure grammars, Molecular structure, Pictures, Theory.

Various contentions of the grammatical approach to pattern recognition are critically examined. The most general tenet of this school of thought is that a pattern should be considered as composed of components of known types arranged in certain fashion. One of the most specific assumptions is that the rules governing the arrangement of components form a 'finite' phrase structure grammar. There is a whole gamut of view-points between these two poles. Their grammatical theories, however, are usually ungrammatical in some strict sense. The author introduces two examples of structure description, one of pictorial patterns with a set of group-theoretical rules and the other a set of rules of linearization of chemical structural formulae. They are both grammatical in the sense that they are based on production rules. But the first is ungrammatical because it is so strongly Gestalt-forming that no local substitution is allowed. The second is ungrammatical because the grammaticalness cannot define the set of actually existing molecules. (Modified author abstract)

COM-73-11718/6GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
BIONICS. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1970-Sep 73,
Edward J. Lehmann. Oct 73, 40p* NTIS-WIN-73-068
Supersedes NTIS-PK-87.

Descriptors: (*Bionics, *Bibliographies), Artificial intelligence, Automata theory, Bioengineering, Human factors engineering, Man-machine systems, Robots, Systems engineering.

The NTISearch bibliography contains 35 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. All aspects of bionics are presented including both theory and applied studies on neural systems and visual perception. (Author)

N73-31146/6GA PC$3.50/MF$1.45
Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
ROBOT COMPUTER PROBLEM SOLVING SYSTEM.
Quarterly Progress Report, 1 Apr. - 30 Jun. 1973.
E. W. Merriam, and J. D. Becker. 15 Jul 73, 28p
NASA-CR-133942, QPR-6
Contract NASW-2236

Descriptors: *Computer systems programs, *Mars surface, *Problem solving, *Robots, Display devices, Fortran, Occlusion, Space environment simulation, Surface vehicles.

For abstract, see STAR 1122

6E. Clinical Medicine

AD-768 449/1GA MF$1.45
National Research Council Washington D C Committee on Red Blood Cell Preservation
PRESERVATION OF RED BLOOD CELLS,
Hugh Chaplin, Jr., Ernst R. Jaffe, Claude Lenfant, and C. Robert Valeri. 1973, 355p*
Contract DADA17-69-C-9084
Proceedings of a Conference sponsored by National Research Council, Washington, D.C. Div. of Medical Sciences, 5-6 Jun 72. International Standard Book No. 0-309-02135-0.
Availability: Paper copy available from National Academy of Sciences, 2101 Constitution Ave., N.W., Washington, D.C. 20418. $7.00.

Descriptors: (*Erythrocytes, Preservation), Symposia, Medical research, Blood transfusions, Transport properties, Oxygen, Storage, Management engineering, Physiology, Survival, Blood.
Identifiers: *Blood preservation, *Blood banks, Cryobiology.

The papers presented in this volume were prepared for a conference sponsored by the NRC Division of Medical Sciences. For the benefit of medical practitioners, blood bankers, administrators, and biomedical engineers, these papers review such topics as the clinical uses of blood, the management of blood resources, oxygen transport and red-cell function, red-cell survival, and the current status and future of research in red-cell preservation. Information on current research and technology is presented and evaluated not only to encourage its practical application but also as a means of defining areas where further research is needed. The information presented in this report also demonstrates that blood can be stored in such a way as to preserve the viability and function of its red cells for long periods.

AD-768 479/8GA Reprint
Naval Dental Research Inst Great Lakes Ill
HISTORY OF FLUORIDE, DENTAL FLUOROSIS, AND CONCENTRATIONS OF FLUORIDE IN SURFACE LAYER OF ENAMEL OF CARIES-FREE NAVAL RECRUITS.
Research progress rept.,
Harris J. Keene, James R. Mellberg, and Clyde R. Nicholson. Oct 73, 10p Rept no. NDRI-PR-73-04
Availability: Pub. in the Jnl. of Public Health Dentistry, v33 n3 p142-148 1973.

Descriptors: (*Teeth, *Fluorides), Dentistry, Water supplies.
Identifiers: Dental caries, Preventive dentistry.

Caries-free men from the naval recruit population at Great Lakes, Illinois tend to have a greater history of exposure to fluoride in drinking water during the period of tooth formation than other recruits with dental caries. This greater exposure to fluoride is manifested by higher dental fluorosis scores and a higher fluoride content of surface enamel in the caries-free group. Enamel fluoride concentration shows an inverse relationship with distance from the tooth surface irrespective of dental caries status. (Author)

AD-768 499/6GA Reprint
National Inst of Allergy and Infectious Diseases Hamilton Mont Rocky Mountain Lab
AEROSOL-INDUCED TUBERCULOSIS IN SUBHUMAN PRIMATES AND THE COURSE OF THE DISEASE AFTER INTRAVENOUS BCG VACCINATION,
W. R. Barclay, R. L. Anacker, W. Brehmer, W. Leif, and E. Ribi. 6 Jul 70, 9p
Availability: Pub. in the Infection and Immunity, v2 n5 p574-582 Nov 70.

Descriptors: (*Mycobacterium tuberculosis, *Monkeys), (*Vaccines, Mycobacterium tuberculosis), Experimental data, Models(Simulations), Laboratory animals, Infectious diseases, Bacteria, Immunity.
Identifiers: Macaca mulatta, *BCG vaccine.

Suitability of the rhesus monkey (Macaca mulatta) as an experimental host for evaluation of vaccines against airborne infection with Mycobacterium tuberculosis strain H37Rv was investigated. Nonvaccinated monkeys were exposed to estimated doses of 12, 25, or 49 units of H37Rv in a modified Henderson apparatus, and the course of the disease was followed by chest X rays, skin testing with purified protein derivative, body-weight determinations, and autopsy 8 weeks postinfection. These animals developed progressive and extensive tuberculosis with pathological changes proportional to the infecting dose.

AD-768 628/0GA Reprint
Naval Medical Research Unit No 4 Great Lakes Ill
EFFECT OF DOSE AND ROUTE OF IMMUNIZATION ON THE ANTIBODY RESPONSES OF HUMANS TO A/PR/8/34(HON1) INFLUENZA VACCINE,
M. J. Rosenbaum, R. E. Mammen, E. A. Edwards, W. E. Frazier, and R. O. Peckinpaugh. 1973, 9p
Availability: Pub. in International Symposium on Influenza Vaccines for Men and Horses Held in London, 1972, Series Immunobiology Standard, v20 p191-197 1973.

Descriptors: (*Vaccines, *Injection(Medicine)), (*Influenza virus, Vaccines), Immunity, Effectiveness, Antigens + antibodies, Skin, Nose.
Identifiers: Dosage forms.

To determine the best method for administration of influenza vaccines, an inactivated, zonal centrifuged A/PR/8/34 (HON1) vaccine was given to Navy recruits in various doses by intradermal, subcutaneous and intranasal routes. Serum (HI) and nasal (Nt) antibody titers were determined. Data were analyzed for magnitude of antibody increase, percent seroconversion and speed of response. Considerably more antigenic mass was required by the intranasal route to produce a seroresponse similar to that provoked parenterally. The intradermal method required less antigen than the subcutaneous to produce equivalent humoral antibody responses. All vaccination routes stimulated nasal secretory antibody, but the intradermal method produced the highest titers. (Author)

AD-768 629/8GA Reprint
Naval Medical Research Unit No 4 Great Lakes Ill
LIVE INFLUENZA VACCINE STUDIES IN HUMAN VOLUNTEERS,
E. A. Edwards, R. E. Mammen, M. J. Rosenbaum, R. O. Peckinpaugh, and J. R. Mitchell. 1973, 8p
Availability: Pub. in International Symposium on Influenza Vaccines for Men and Horses, London 1972; Symposium Series Immunobiology Standard, v20 p289-294 1973.

Descriptors: (*Influenza virus, *Vaccines), (*Immunity, Influenza virus), Dosage, Acceptability, Effectiveness, Antigens + antibodies, Virus diseases, Humans, Biological assay.

Cold adapted attenuated live influenza virus vaccine, either A2/Aichi/2/68 or B/Tec/1/69, was given to Navy recruit volunteers to determine acceptability and antigenicity. Immunization was by nasal drops or spray. Dosage ranged from 3.5 - 7.5 log EID50. No adverse effects were noted; the only complaints were 'stuffy' noses. Only 2 of 165 matched controls shed A2/Aichi virus. This may have resulted from spread or natural infection. Less than 50% of the vaccinees seroconverted (HI) with doses of 5.5 log or less by either route. Seroconversion rates to A2/Aichi in doses of 5.5, 6.5 or 7.5 log given by spray were 28, 44 and 80%, respectively. Seroconversions to the same dosage of B/Tec were 35, 38 and 50%, respectively. Three and 6 weeks post-immunization serology showed that the magnitude of rise was related to dose; antibody levels from doses of 5.5 log declined by the 6th week, but the titer of those who received 7.5 log dose remained stable or increased at 6 weeks. These data show that attenuated live influenza virus vaccine can stimulate seroresponse in humans without adverse clinical effects. (Author)

AD-768 715/5GA PC$11.25/MF$1.45
Army Research Inst of Environmental Medicine Natick Mass
ARMY RESEARCH AND DEVELOPMENT TECHNICAL REPORT.
Annual progress rept. 1 Jul 72-30 Jun 73.
1 Jul 73, 181p

Descriptors: (*Military medicine, Environment), (*Stress(Physiology), Environment), Physiology, High altitude, Training, Cold weather tests, Fatigue(Physiology).

The research projects reported are as follows: An electrophysiologic study of prolonged hypoxia; historical analysis, development and distribution of military environmental medical information; neurophysiological investigations of the glucose dependency of the thermoregulatory center of the hypothalamus; disease susceptibility of soldiers in harsh environments; bioenergetics related to heavy physical work ability of the soldier; development of measures to assess the impace of environmental stresses on critical military performance; development and characterization of models to study acute mountain sickness and high altitude pulmonary edema in military operations.

AD-768 736/1GA PC$3.50/MF$1.45
National Defense Medical Center Taipei (Taiwan) Div of Parasitology
THE POSSIBILITY OF MILITARY PERSONNEL ACQUIRING BANCROFTIAN FILARIASIS IN ENDEMIC AREA OF KINMEN (QUEMOY) ISLANDS.
Annual rept. no. 4, 1 Jul 72-30 Jun 73,
Ping-Chin Fan. 3 Oct 72, 69p ARDG(FEE)-468-4
Grant DA-CRD-afe-S92-544-71-g176
See also report dated Sep 72, AD-751 220.

Descriptors: (*Filariae, *Parasitic diseases), Military personnel, Military medicine, Epidemiology, China, Disease vectors, Culicidae, Entomology.
Identifiers: *Filariasis, Wuchereria bancrofti, Kinmen Islands.

According to recent reports (Fan, 1972; and Fan et al. 1973) bancroftian filariasis is still highly prevalent among the local Kinemen Chinese with a microfilarial (mf.) rate of 10%, mf. density/20 cmm of 17, clinical rate of 12%, mosquito infection rate of 10%, and filarial larvae density/infected mosquito of 5.6. Based on the present basic information about the prevalence of filariasis among the local civilian population and regarding the great threat to the health and welfare of young Chinese troops rotatory stationing on the islands of Kinmen, a joint project for filariasis control for a period of five years has been performed. The present study proposes to find more supporting data for comparison of filarial infection in man and mosquito between villages and neighbour camps, and continuously to demonstrate the possibility of military personnel acquiring bancroftian filariasis in the previously selected camps and villages on Kinmen Islands in 1972.

AD-768 738/7GA PC$3.00/MF$1.45
Seoul National Univ (Republic of Korea) Dept of Parasitology
NATURE AND CONTROL OF SIDE-REACTIONS DUE TO DIETHYLCARBAMAZINE IN THE TREATMENT OF MALAYAN FILARIASIS.
Annual rept. no. 2, 27 Jul 72-26 Jul 73,
Byong-Seol Seo. 27 Sep 73, 40p ARDG(FE)-486-2
Grant DA-RDRF-S92-544-72-G189

Descriptors: (*Anthelminticas, Responses), (*Filariae, Anthelmintics), Parasitic diseases, Chemotherapeutic agents, Fevers, Pain, Fatigue(Physiology), South Korea.
Identifiers: Filariasis, *Diethylcarbamazine.

The side-effects such as febrile reactions after the initial dose of diethylcarbamazine are the most difficult problems in the mass treatment of malayan filariasis. Proper understanding on the nature and cause of these adverse reactions is strongly suggested and the establishment of the adequate control measure against these reactions is also drastically necessitated in order to lead successfully the large-scale mass treatment. (Modified author abstract)

AD-768 800/5GA PC$5.50/MF$1.45
Defense Documentation Center Alexandria Va
MEDICAL PROBLEMS OF SPACE FLIGHT.
Bibliography Jan 68-Feb 73.
Oct 73, 206p* Rept no. DDC-TAS-73-58
See also report dated Mar 69, AD-685 500.

Descriptors: (*Space medicine, *Bibliographies), Weightlessness, Space environmental conditions, Tolerances(Physiology), Controlled atmospheres, Radiation hazards, Hematology, Exercise, Telemeter systems, Adaptation(Physiology), Motion sickness.

The bibliography contains references to reports pertinent to observing and measuring the various aspects of space medicine in a real or simulated space environment using men and laboratory animals. The indexes included are Corporate Author-Monitoring Agency, Subject and Personal Author. (Author)

AD-768 824/5GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
EXPERIMENTELLER BEITRAG ZUR PATHOGENESE DER TOLLWUT (EXPERIMENTAL CONTRIBUTION TO THE PATHOGENESIS OF RABIES),
M. Petrovic, and H. Timm. 19 Mar 69, 13p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene. I. Originale (West Germany) V211-S p149-161 1969.

Descriptors: (*Rabies virus, Pathology), Virus diseases, Immune serums, Laboratory animals, Viruses, Placenta, Infections, West Germany, Experimental data.

The authors report on pathogenesis experiments performed on Syrian golden hamsters, Chinese dwarf hamsters and albino mice, using plantar adapted virus fixe (CVS). Transmission of virus via placenta was not observed after intraplantar infection of gravid mice. Following intraplantar infection of Syrian golden hamsters and Chinese dwarf hamsters virus could be demonstrated at the site of inoculation from the moment of administration till the end of the experiment. Passive immune therapy applied to albino mice and Chinese dwarf hamsters after plantar infection yielded the following results: A single serum dose administered one hour prior to infection proved capable of preventing rabies infection in experimental animals. If passive immunization occurred after infection, only part of the animals were protected. (Modified author abstract)

AD-768 864/1GA PC$3.00/MF$1.45
Illinois Univ Urbana Dept of Microbiology
ROLE OF MYCOPLASMA MEMBRANES IN THE PATHOGENESIS OF PRIMARY ATYPICAL PNEUMONIA.
Annual rept. no. 1, 1 Sep 72-31 Aug 73,
Michael G. Gabridge. Oct 73, 37p* Rept no. UI4
Contract DADA17-73-C-3016

Descriptors: (*Mycoplasma, Respiratory diseases), (*Respiratory diseases, Pathology), (*Membranes(Biology), Mycoplasma), Respiratory system, Cells(Biology), Necrosis, Toxicity.
Identifiers: Mycoplasma pneumoniae, *Pneumonia.

Primary atypical pneumonia, caused by Mycoplasma pneumoniae, is a significant health problem among military recruits. The current study was designed to yield information on the mechanism of pathogenesis in this disease. Special processes for the cultivation of the causative agent have been developed. Organisms were collected and membrane fractions were prepared. When membranes were evaluated for cytotoxic potential in the hamster tracheal ring/organ culture system, they displayed active biological activity. The necrosis induced in the ciliated respiratory epithelium was grossly equivalent to that induced by viable cells, and was dose-dependent. The data indicate that the cell membrane of this pathogen may be the site of the toxic factor. Further biological and biochemical identification of this toxic factor could ultimately play a key role in the development of a suitable vaccine to reduce the high morbidity rate associated with this disease. (Author) Portions of this document are not fully legible.

AD-768 868/2GA PC$2.75/MF$1.45
Boston Univ Mass School of Medicine
REJECTION MECHANISMS IN CORNEAL TRANSPLANTATION.
Final scientific rept.,
Howard M. Leibowitz, and Ephraim Freidman. 15 Oct 73, 7p
Contract DADA-17-69-C-9109
See also AD-705 675.

Descriptors: (*Cornea, *Transplantation), (*Immunology, Transplantation), (*Antigen-antibody reactions, Transplantation), Antigens + antibodies, Immunity.
Identifiers: *Xenogenic keratoplasty, Keratoplasty.

The report details efforts to characterize the transplantation antigens of the cornea as encountered in xenogeneic keratoplasty. Three protein factions have been isolated from the cornea. Each has been shown to possess transplantation antigen activity as demonstrated by its ability to induce a specific sensitization resulting in the accelerated destruction of a subsequent corneal graft. The antigenic fractions are also capable of stimulating the production of humoral antibodies. The relationship between the transplantation immunity and the antibody response will be discussed. (Author)

AD-768 888/0GA PC$2.75/MF$1.45
Utah Univ Salt Lake City Dept of Pathology
STUDIES ON GONOCOCCUS INFECTION.
Rept. no. 1 (Annual), 1972-73,
John L. Swanson. Oct 73, 18p
Contract DADA17-72-C-2146

Descriptors: (*Neisseria gonorrhoeae, Infections), (*Urinary system, Infectious diseases), Venereal diseases, Immunity, Pathology, Leukocytes, Radioactive isotopes.
Identifiers: *Gonorrhea.

Pilated gonococci adhere to tissue culture cells to a much greater extent than do non-pilated organisms. A similar attachment propensity of pilated gonococci has been found also with human buccal epithelia cells. Pilated gonococci readily attach to and/or are ingested by human neutrophils, in vitro. The role of pili in actually mediating such association between gonococci and leukocytes is unclear because of the occurrence of two forms of colony type 4 gonococci. One of these (T4) shows little or no ability to associate with leukocytes whereas the other (T4*) is attached-ingested by leukocytes to an extent exceeding that of pilated, T2 gonococci. Type 2 gonococci are more capable of establishing an acute infection in a mouse model of gonococcal infection than are type 4 organisms. Methods have been developed for radioactively labelling gonococci with 14C or 3H. Also modifications of the critical point procedure have been devised such that gonococci and eukaryotic cells can be studied relative to their surface detail and surface relationships in the same specimen by electron microscopy.

AD-768 906/0GA PC$5.75/MF$1.45
Brooke Army Medical Center Fort Sam Houston Tex
CLINICAL INVESTIGATION SERVICE.
Annual research progress rept.
1973, 238p
See also AD-751 197.

Descriptors: (*Medical research, Reports), Immunology, Neurology, Pathology, Physiology, Toxicity, Microbiology, Biochemistry, Diseases, Infectious diseases, Diagnosis, Therapy, Pharmacology, Prosthetics, Neoplasms, Surgery, Dentistry.
Identifiers: Gynecology.

The Clinical Investigation Service was established at Brooke Army Medical Center 9 August 1971 to coordinate clinical investigation activities throughout the hospital complex. It is an independent service directly under the command of the Chief, Professional Services, and operates under the guidance of the Clinical Investigation Committee composed of the chiefs of the various professional departments and the Human Use Committee. The Clinical Investigation Service was established to promote, stimulate, coordinate, and provide support for clinical investigation and development activities within Brooke Army Medical Center, including design of experiments, typing and editorial service, and technical liaison with outside facilities.

AD-768 982/1GA PC$2.75/MF$1.45
Medical Research Foundation of Oregon Portland
ANTI-LYMPHOCYTE ANTIBODIES: SPECIFICALLY PURIFIED ANTI-THYMOCYTE ANTIBODY AS AN IMMUNOSUPPRESSIVE AGENT IN HUMAN AND RHESUS TRANSPLANTS.
Final technical rept. Sep-Oct 73,
Billie J. Wilson, and Arthur (NMI) Malley. 31 Oct 73, 6p Rept no. A001AJ
Contract N00014-72-C-0037

Descriptors: (*Lymphocytes, *Antigens + antibodies), (*Immunology, Transplantation), Thymus, Humans, Monkeys, Purification.
Identifiers: Immunosuppression.

To further isolate the immunosuppressive fraction of antithymocyte antibody, the mouse skin graft system has been developed to test subfractions. The technique of Billingham is used to skin graft between the A/J-C3H strains of mice. Antimouse thymocyte sera has been prepared and a dosage schedule selected and tested. The initial stage of a toxicity experiment has been performed. The authors prepared a toxic sera by hyperimmunization and then selected out the suppressive fraction with an adsorbent. Sheep ATS does not become toxic for mice on hyperimmunization. The whole blood mixed lymphocyte system has been developed in the rhesus monkey. Obtained were high levels of reactivity which had not previously been possible. (Modified author abstract)

AD-769 012/6GA Reprint
Brooke Army Medical Center Fort Sam Houston Tex
PATHOPHYSIOLOGY OF METABOLIC ALKALOSIS,
Neil A. Kurtzman, Martin G. White, and Philip W. Rogers. 2 Aug 72, 8p
Revision of report dated 5 Jul 72.
Availability: Pub. in Archives of Internal Medicine, v131 p702-708 May 73.

Descriptors: (*Metabolic diseases, Etiology), Deficiency diseases, Chlorine, Potassium, Corticosteroid agents, Minerals.
Identifiers: Pathophysiology, *Alkalosis.

The generation of experimental metabolic alkalosis by the kidney was found to require the presence of excess mineralocorticoid hormone and potassium deficiency. Once generated, metabolic alkalosis could be maintained in the absence of excess mineralocorticoid, provided a strong stimulus (extracellular volume contraction or potassium deficiency or both) to proximal reabsorption was present. When proximal reabsorption was not markedly stimulated, metabolic alkalosis was corrected on reduction or discontinuance of mineralocorticoid; under these circumstances correction of potassium deficiency also corrected metabolic alkalosis. The development of metabolic alkalosis by the kidney requires accelerated distal tubular Na(+) for H(+) exchange. This mechanism may also maintain metabolic alkalosis as may increase proximal H(+) secretion. (Author)

AD-769 014/2GA Reprint
Brooke Army Medical Center Fort Sam Houston Tex
GRANULOCYTE KINETICS AFTER THERMAL INJURY,
Karl Eurenius, and Richard O. Brouse. 13 Oct 72, 7p
Revision of report dated 20 Apr 72.
Availability: Pub. in American Jnl. of Clinical Pathology, v60 n3 p337-342 Sep 73.

Descriptors: (*Burns, *Blood cells), (*Leucocytes, Burns), Hematology, Rats, Cytology, Stress(Physiology), Experimental data.
Identifiers: Thermal burns.

A 30% third-degree burn in rats was used to study granulocyte kinetics after thermal injury. Early postburn leukocytosis, a result of granulocyte demargination and early bone marrow release, was followed by an absolute granulocytopenia, despite elevated concentrations of circulating cells. The total peripheral granulocyte pool was slowly restored to normal in the presence of increased marrow production and release and the reestablishment of a marginating pool. (Author)

AD-769 015/9GA Reprint
Brooke Army Medical Center Fort Sam Houston Tex
RENAL FAILURE, UNCONTROLLABLE THIRST, AND HYPERRENINEMIA. (CESSATION OF THIRST WITH BILATERAL NEPHRECTOMY),
Philip W. Rogers, and Neil A. Kurtzman. 1973, 4p
Availability: Pub. in Jnl. of the American Medical Association, v225 n10 p1236-1238, 3 Sep 73.

Descriptors: (*Kidneys, Diseases), Ingestion(Physiology), Fluids, Therapy, Surgery, Pathology, Physiology.
Identifiers: *Hemodialysis, Hyperreninemia, *Uremia, Thirst, Angiotensin.

A patient having long-term hemodialysis with uncontrollable thirst, persistent hyponatremia, and expanded extracellular volume was found to have hyperreninemia before and after hemodialysis. The clinical course of this patient and a similar one from the literature confirm previous investigative studies that suggest that elevated levels of circulating renin (angiotensin) may directly stimulate the thirst center of the hypothalamus. Bilateral nephrectomy in both patients resulted in the dramatic cessation of thirst. (Author)

AD-769 020/9GA Reprint
Navy Toxicology Unit Bethesda Md
SCANNING AND TRANSMISSION ELECTRON MICROSCOPIC STUDIES OF AN EXSTROPHIC HUMAN BLADDER,
Michael A. Clark, and Kevin J. O'Connell. 20 Apr 73, 4p
Availability: Pub. in Jnl. of Urology, v110 p481-483 Oct 73.

Descriptors: (*Urinary system, Visual inspection), (*Anomalies, Urinary system), Electron microscopy, Humans, Cancer, Cytology.
Identifiers: *Congenital abnormalities, Bladder(Urinary).

A correlative scanning and transmission electron microscopic study of an exstrophic bladder from a one-year-old girl is presented. The urothelium of the exstrophic bladder differs markedly from descriptions of normal bladder urothelium--surface ridges are lacking and the individual urothelial cells are covered with microvilli. The similarities in surface ultrastructure of exstrophic bladder and transitional cell carcinoma urothelium are discussed as are the pits found on normal and abnormal urothelial cells.

AD-769 021/7GA Reprint
Navy Toxicology Unit Bethesda Md
UNILATERAL DIVERTICULUM OF THE URETER: A CASE REPORT AND SCANNING ELECTRON MICROSCOPIC STUDY,
Michael A. Clark, Kevin J. O'Connell, Thomas A. Maclean, and Thomas M. Conner. 4 May 73, 11p
Availability: Pub. in Jnl. of Urology, v110 p478-480 1973.

Descriptors: (*Urinary system, Visual inspection), (*Anomalies, Urinary system), Electron microscopes, Humans, Cell structure.
Identifiers: *Congenital abnormalities, Ureters.

The surface ultrastructure of a unilateral ureteral diverticulum was studied by scanning electron microscopy and compared to that of normal ureters. Although the normal ureteral urothelial cells present a squamoid appearance, the cells of the diverticulum are pyramidal. The intercellular spaces are grossly exaggerated and continuous with the lumen. Possible mechanisms for this urothelial alteration are discussed.

AD-769 079/5GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
IMPLICATIONS TO HUMANS: INTRODUCTION,
R. H. Watten. 1973, 4p Rept no. NAMRU-2-TR-564
Availability: Pub. in Nutrition Reports International, v7 n5 p511-515 May 73.

Descriptors: (*Nutrition, *Pregnancy), Symposia, Reproduction(Physiology), Humans, Public health.

The primary purpose of this symposium is succinctly stated in its title, The Effect of Maternal Nutrition on the Development of the Offspring. The effects produced in laboratory animals by modification of maternal diets have been summarized. It is of great practical importance to determine the variey and degree of any possible corresponding effects in the human resulting from variations in maternal diet. The present status of human studies relating to this subject was summarized and discussed in this session.

AD-769 082/9GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
TURNOVER STUDIES OF COPPER IN HOMOZYGOTES AND HETEROZYGOTES FOR WILSON'S DISEASE AND CONTROLS: ISOTOPE TRACER STUDIES WITH 67CU,
G. T. Strickland, W. M. Beckner, Mei-Ling Leu, and S. O'Reilly. 26 Apr 72, 15p Rept no. NAMRU-2-TR-569
Availability: Pub. in Clinical Science, v43 p605-615 1972.

Descriptors: (*Copper, Metabolic diseases), (*Liver, Copper), (*Metabolic diseases, Liver), Radioactive isotopes, Genetics, Humans, Experimental data.
Identifiers: *Wilsons disease, Hepatolenticular degeneration.

Studies with 67Cu were carried out on thirteen patients with Wilson's disease (WD), twenty-nine of their parents and siblings, thirteen normal subjects and seven subjects with cirrhosis of the liver. Control subjects and five siblings of patients with WD generally excreted more than 15% of the dose of 67Cu in their five day stool collections, had normal liver/thigh radioactivity ratio patterns, and had whole-body biological 67Cu half-times of less than 40 days. The remaining twenty-four family members, including all twelve parents, and the patients with WD GENERALLY EXCRETED LESS THAN 15% of the dose of 67Cu in their five-day stool collections, had abnormal liver/thigh radioactivity ratio patterns, and had whole-body biological 67Cu half-times greater than 40 days. The data demonstrate a normal 67Cu biological half-time of 28 days and faecal excretion of 22% in five days, and suggest a decreased biliary excretion of copper in both homozygous and heterozygous individuals with WD.

AD-769 083/7GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
IMMUNODIAGNOSIS OF SOME PARASITIC DISEASES OF THE RESPIRATORY SYSTEM,
John H. Cross. 20 Apr 73, 10p Rept no. NAMRU-2-TR-567
Presented at the Symposium on Parasitic Diseases of the Respiratory System, Asia Pacific Congress on Diseases of the Chest, (2nd) Taipei, Taiwan, 12 Nov 71.
Availability: Pub. in Jnl. Formosan Medical Association, v72 p407-412 1973.

Descriptors: (*Respiratory system, Parasitic diseases), (*Parasitic diseases, *Serodiagnosis), (*Immunology, Parasitic diseases), Diagnosis, Tests, Antigen-antibody reactions.

A review is presented of the serologic tests used in the diagnosis of some parasitic infections of the pulmonary system, and comments are made on the immunodiagnosis of pulmonary amebiasis, pneumocystosis, toxoplasmosis, hydatidosis, cysticercosis, schistosomiasis, paragonimiasis, ascariasis-toxocariasis and filariasis. Most of the serologic tests used are of value but many lack the specificity and sensitivity required for a definitive diagnosis. The serological diagnosis of these diseases, therefore, should only be considered as supplemental and not as a substitute for the definitive diagnosis which is the actual demonstration of the parasite.

AD-769 087/8GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
ABSORPTION OF COPPER IN HOMOZYGOTES AND HETEROZYGOTES FOR WILSON'S DISEASE AND CONTROLS: ISOTOPE TRACER STUDIES WITH 67CU AND 64CU.
Technical rept.,
G. T. Strickland, W. M. Beckner, and Mei-Ling Leu. 26 Apr 72, 13p Rept no. NAMRU-2-TR-570
Availability: Pub. in Clinical Science, v43 p617-625 1972.

Descriptors: (*Copper, Metabolism), (*Anomalies, Metabolism), (*Absorption(Biological), Copper), Tests, Experimental data, Genetics, Biliary system.
Identifiers: *Wilsons disease, Hepatolenticular degeneration, Congenital abnormalities.

Absorption of copper was determined by the simultaneous administration of 64Cu orally and 67Cu intravenously to six patients with Wilson's disease (WD), eighteen of their parents and siblings, four normal subjects and three subjects with cirrhosis of the liver. Adsorption was calculated by the mean ratio of 64Cu to 67Cu body retention at three and four days as determined by whole-body counting, the mean ratio of 64Cu to 67Cu at three and four days as determined by faecal excretion, and the mean ratio of 64Cu to 67Cu plasma radioactivity 6-24 hours after administration. The total-body counting and faecal methods for determining copper absorption agreed with each other, demonstrating that the normal absorption of copper is 40-70% (mean 56%) of the dose and that absorption is not influenced by cirrhosis of the liver, age or sex; but it appears to be inversely related to the amount of carrier copper. The absorption of copper in both homozygotes and heterozygotes for WD did not differ significantly from that of the control subjects. Therefore, the increased body burden of copper in WD does not appear to be due to over absorption, but rather to decreased biliary excretion of copper. (Modified author abstract)

AD-769 101/7GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
THE TRANSMISSION DYNAMICS OF SCHISTOSOMIASIS,
Ingemar Nasell, and Warren M. Hirsch. Nov 72, 60p
Contract N00014-67-A-0467-0004
Prepared in cooperation with Bell Telephone Labs., Murray Hill, N. J.
Availability: Pub. in Communications on Pure and Applied Mathematics, v26 p395-453 1973.

Descriptors: (*Schistosoma, Infections), (*Epidemiology, Schistosoma), Parasitic diseases, Disease vectors, Public health, Tropical regions, Gastropoda, Mathematical analysis.
Identifiers: Schistosomiasis, Host parasite relations.

The phase of the schistosome's life cycle when the parasite is passing from snail to human is more sensitive to interruption than the phase when the parasite is being transmitted from human to snail. Regardless of the criterion adopted, be it eradication, control, or improvement of public health conditions, diminution of the transmission potential along the arc from snail to human is more efficient than a corresponding decrease in the transmission potential along the arc from human to snail. It is of interest to note that similar but not identical results hold for helminthic infections in which the parasite's life cycle resembles that of the schistosome, but where each parasite contains both testes and ovaries, and each worm lays ova.

BNL-17917/GA PC$3.50/MF$1.45
Brookhaven National Lab., Upton, N. Y.
RADIOISOTOPES IN MEDICINE.
H. L. Atkins. 1973, 27p CONF-730119-3

Descriptors: (*Radioisotopes, *Reviews), (*Nuclear medicine, Reviews), Bone marrow, Brain, Cameras, Chelates, Colloids, Drugs, Energy range, Erythrocytes, Gamma radiation, Liver, Lymph nodes, Radioisotope scanning, Semiconductor detectors, Spleen.

For abstract, see NSA 28 08, number 18567.

BNL-17991/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
SMALL COMPUTER ASSISTED ANALYSIS OF CAMERA RENOGRAMS.
P. D. Esser, P. R. Bradley-Moore, H. L. Atkins, J. S. Robertson, and A. N. Ansari. 1972, 13p CONF-730627-2

Descriptors: (*Scintiscanning, *Data acquisition systems), (*Urogenital system diseases, *Diagnostic techniques), Albumins, Blood serum, Computer calculations, Dtpa, Gamma cameras, Hippuran, Iodine 131, Isomeric nuclei, Kidneys, Labelled compounds, Physiology, Radionuclide administration, Technetium 99.

For abstract, see NSA 28 08, number 18577.

COM-73-11651/9GA PC$2.75/MF$1.45
Michigan Univ., Ann Arbor. Sea Grant Program.
HYPERBARIC CHAMBER INFORMATION.
1973, 10p NOAA-73092101

Descriptors: (*Hyperbaric oxygenation, Chambers), Hyperbaric medicine, Therapy, Decompression sickness, Aeroembolism, Embolisms, Divers.
Identifiers: Sea Grant Program, Hyperbaric atmospheres.

A hyperbaric chamber for treating air embolism and decompression sickness is in operation at the University of Michigan. The chamber is available to anyone working under increased ambient pressure, such as scuba divers, commercial divers, and tunnel workers. Emergency contact telephone numbers and a divers medical emergency identification card are given. Information is given to explain what causes air embolism or decompression sickness, the symptoms and first aid as well as the emergency procedures for the Michigan area.

COM-73-11706/1GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
ENVIRONMENTAL CARCINOGENESIS. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-May 73,
Edwazrd J. Lehmann. Aug 73, 52p* NTIS-WIN-73-056
Supersedes NTIS-PK-128.

Descriptors: (*Bibliographies, *Malignant neoplasms), (*Carcinogens, Bibliographies), (*Environmental surveys, Carcinogens), Air pollution, Water pollution, Radiation effects, Solar ultraviolet radiation, Aromatic polycyclic hydrocarbons, Mutagens, Radioactive contaminants, Industrial wastes, Asbestos.

The NTISearch bibliography contains 47 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. Abstracts are included which cover studies concerned with carcinogens found in the environment and their effects. (Author)

COM-73-50845/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
PETROGRAPHIC STUDY OF THE REFRACTORY PERFORMANCE OF HIGH-FUSING DENTAL ALLOY INVESTMENTS: II. SILICA-BONDED INVESTMENTS.
Final rept.,
C. P. Mabie. 1973, 16p
Sponsored in part by American Dental Association, Chicago, Ill.
Pub. in Jnl. of Dental Research, v52 n4 p758-773, 1973.

Descriptors: (*Investment castings, Dental materials), Investment casting, Alloys.
Identifiers: Dental alloys.

Petrographic study of the refractory performance of silica-bonded investments revealed that recrystallized silica bonds consisting of tridymite and cristobalite are formed during burnout. The major reaction product created during casting is eskolaite. Liquefaction and sintering in the investment at and near its interface with the casting plugs pores and may lower permeability.

CONF-730639-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
REGULATION OF GENE EXPRESSION AND VIRAL NEOPLASIA.
F. T. Kenney, K. L. Lee, and J. N. Ihle. 1973, 16p

Descriptors: (*Carcinogenesis, *Biochemical reaction kinetics), Aminotransferases, Animal cells, Dna, Genes, Genome mutations, Mammals, Messenger-rna, Neoplasms, Tyrosine, Viruses.

For abstract, see NSA 28 07, number 17741.

JPRS-60209/GA PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
HISTORY AND DEVELOPMENT OF PSYCHIATRY IN THE USSR,
T. Degenhardt. 5 Oct 73, 9p
Trans. of Das Deutsche Gesundheitswesen (East Germany) n10 p433-436 1973.

Descriptors: (*Psychiatry, *USSR), History, Development, Translations.

The humane and understanding treatment of mental patients past and present is stressed. The relevant training of medical students is briefly discussed.

N73-30059/2GA PC$4.25
National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 116, JUNE 1973.
Jun 73, 101p NASA-SP-7011(116)

Descriptors: *Aerospace medicine, *Bibliographies, *Biology, Biological effects, Catalogs (Publications), Indexes (Documentation).

For abstract, see STAR 1121

N73-30991/6GA PC$3.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
V. V. STRELTSOV: THE FOUNDER OF THE SOVIET SCHOOL OF AVIATION-SPACE MEDICINE.
N. A. Agadzhanyan. Oct 73, 20p NASA-TT-F-15101
Contract NASW-2485
Tran-Transl. Into English from Priroda (Moscow), No. 8, Aug. 1973 p 50-56.

Descriptors: *Aerospace medicine, *Research projects, *U.s.s.r., Hypoxia, Medical personnel, Medical science, Plants (Botany), Rhythm (Biology).

For abstract, see STAR 1122

N73-31001/3GA PC$7.75/MF$1.45
Research Triangle Inst., Research Triangle Park, N.C.
NASA APPLICATION TEAM PROGRAM: APPLICATION OF AEROSPACE TECHNOLOGY IN BIOLOGY AND MEDICINE.
Final Report, Sep. 1972 - Aug. 1973.
31 Aug 73, 111p NASA-CR-135527
Contract NASW-2459

Descriptors: *Aerospace medicine, *Nasa programs, *Technology transfer, Bioengineering, Bioinstrumentation, Computer techniques, Technology utilization.

For abstract, see STAR 1122

ORAU-119/GA PC$4.00/MF$1.45
Oak Ridge Associated Universities, Inc., Tenn. Medical Div.
CODING INDEX FOR TUMOR SCANNING.
R. M. Kniseley. 1973, 6p

Descriptors: (*Radioisotope scanning, *Data processing), Information, Organs, Patients, Tissues.

For abstract, see NSA 28 07, number 17785.

PB-224 071/1GA PC$3.00/MF$1.45
Cedars-Sinai Medical Center, Los Angeles, Calif.
INVESTIGATION OF THE PATHOPHYSIOLOGY OF THE DIALYSIS DISEQUILIBRIUM SYNDROME.
Annual progress rept. Jan 72-Jun 73,
Allen I. Arieff, and Shaul G. Massry. 26 Jul 73, 31p* AK-3-72-2201
Contract PHS-72-2201

Descriptors: (*Artificial kidneys, *Brain), (*Cerebrospinal fluid, Artificial kidneys), (*Uremia, Artificial kidneys), Urea, Osmosis, pH, Edema, Blood plasma, Pressure, Convulsive disorders, Parathyroid hormone, Physiology, Pathology, Dogs, Experimental data.
Identifiers: *Hemodialysis, *Dialysis disequilibrium syndrome.

The pathophysiology of dialysis disequilibrium syndrome (DDS) was investigated in acutely uremic dogs (BUN=20 mg/dl, creatinine=12 mg/dl). Rapid hemodialysis of such animals produced a syndrome characterized by elevated CSF pressure, grand mal seizures, and gross brain edema. Biochemically brain water content increased by 12% with an osmotic gradient of 26 mOsm/kg H2)O between brain and plasma with a significant fall in the pH of CSF (from 7.31 to 7.12). This gradient was not due to increased brain content of urea, Na+, K+, Cl-, Ca++ or Mg++, but was due to the presence of an unidentified solute (idiogenic osmoles) generated by the brain. Attempts to prevent DDS by addition of either urea or NaCl to the dialysate were only partially successful, but slow hemodialysis prevented the occurrence of DDS. In addition, in uremic dogs, there was a significant (+48%) increase in brain Ca++ content. The increased brain Ca++ was due to an effect on brain of the excessive quanti-

ties of plasma parathyroid hormone which are present in uremia. Hemodialysis reduced the elevated brain Ca++ while parathyroidectomy prevented it from occurring. Portions of this document are not fully legible.

PB-224 082/8GA PC-GPO/MF$1.45-NTIS
Bureau of Radiological Health, Rockville, Md.
QUALITY CONTROL IN MEDICAL X RAY.
Aug 73, 38p DHEW/FDA-74-8002
Proceedings of the Radiological Health Section of the American Public Health Association Meeting Held at Atlantic City, N.J., 12-16 Nov 72.
Paper copy available from GPO $0.65 as stock no. 1715-00057.

Descriptors: (*X ray analysis, Quality control), (*Radiography, Quality control), (*Public health, Radiography), Radiology, Meetings, Clinical medicine, Diagnosis, Legislation, Physicians, Physicists, Health physics, Medical personnel.

The 1972 Centennial Meeting of the American Public Health Association included a session on Quality Control in Medical X Ray. The session was cosponsored by the APHA Radiological Health Section, Conference on Radiation Control Program Directors, New Jersey Bureau of Radiation Protection, and the FDA Bureau of Radiological Health. These papers present a unique combination of points of view of Government, physician technologist, physicist, and manufacturer on quality control in medical x ray.

PB-224 140/4GA PC$3.00/MF$1.45
IIT Research Inst., Chicago, Ill.
STUDIES ON RESPIRATORY INFECTIONS AND OXYGEN TOXICITY.
Annual rept. 2 Jun 72-1 Jun 73,
James D. Fenters, and Vivian Neary. Jun 73, 32p*
IITRI-L6064-7 NIH-NHLI-71-2155-7
Contract PHS-71-2155
See also report dated May 73, PB-222 079.

Descriptors: (*Oxygen toxicity, *Respiratory diseases), (*Immunity, Oxygen toxicity), (*Infectious diseases, Oxygen toxicity), Hyperoxia, Antibodies, Influenza virus, Klebsiella, Lung, Phagocytes, Mice, Experimental data, Viral diseases, Bacterial diseases, Pneumonia.
Identifiers: Interferons, Interferon production, Klebsiella pneumonial.

Swiss mice were exposed to 60% 02 for 2 wk or 100% 02 for 6,24,48 or 72 hr and challenged with either K. pneumoniae or influenza or both. Mice exposed to 60% 02 and 100% 02 for 48 and 72 hr showed increased mortality when 02 exposure immediately preceded or followed bacterial challenge but not when 02 exposure occurred 24 hr after challenge. Increased mortality was found in mice exposed 72 hr after viral challenge to 60% 02 and 100% 02 for 48 and 72 hr. Increased mortality was observed in mice exposed to 100% 02 for 6 and 24 hr before viral challenge. Significantly higher mortality rates in mice exposed to 60% 02 and increased mortality rates in mice exposed to 100% 02 were found in a concurrent bacterial viral infection. Interferon production was delayed 1 to 2 days in virus infected mice exposed to 100% 02. An increase in alveolar macrophages with abnormal surface structure was found in mice exposed to 02. Hyperoxia had little or no effect on preformed antibody or on the production of antibody.

PB-224 194/1GA MF$1.45
National Academy of Sciences, Washington, D.C. Inst. of Medicine.
INFANT DEATH: AN ANALYSIS BY MATERNAL RISK AND HEALTH CARE. VOLUME I.
Contrasts in health status series.
David M. Kessner, James Singer, Carolyn E. Kalk, and Edward R. Schlesinger. Jul 73, 218p
International Standard Book no. 0-309-02119-7.
Paper copy available from National Academy of Sciences, Washington, D.C. PC$6.00. Casebound $8.00.

Descriptors: (*Pregnancy, *Medical services), (*Infants, Mortality), (*Health, Infants), Pregnancy complications, Statistical data, Birth, Education, Public health, Ethnic groups, New York, Demography, Socioeconomic status.
Identifiers: *Prenatal care.

The volume reports evidence that medical care during pregnancy has a significant impact on infant birth weight and survival. The study is based on an analysis of 140,000 infant births and 3,100 infant death in New York City during 1968. It analyzes the relationships among the medical, social, and demographic characteristics of the mothers, the maternal health services they received, and the survival or death of their infants. It also outlines the method used to assign risk categories to pregnant women and cites differences in the rate of infant survival among women of different risk groups.

PB-224 221/2GA PC$9.00/MF$1.45
Department of Health, Education, and Welfare, Washington, D.C. Office of the Secretary.
REPORT ON THE SECRETARY'S COMMISSION ON MEDICAL MALPRATICE.
Final rept.,
Wendell G. Freeland. 16 Jan 73, 465p* DHEW/OS-73-51

Descriptors: (*Medical services, Quality), Claims, Insurance, Consumers, Physicians, Hospitals, Standards, Litigation, Legislation, Statistical data, Data acquisition.
Identifiers: *Medical malpractice, Consumer protection.

In 1971 the President directed the Secretary of HEW to create a Commission on Medical Malpractice to investigate problems associated with professional liability claims against all categories of health care providers and institutions. The report takes the form of a systems analysis of the four basic communities of interest involved--medical, legal, insurance, and general public. Sources of basic statistical information about malpractice claims experience, and the feasibility of establishing nationwide data gathering capability are discussed. The fundamental and contributing causes leading to malpractice claims are identified, and their health care, legal, social, and economic consequences delineated. The commission's recommendations are aimed at preventing medical injuries, deterring unnecessary malpractice claims, improving the efficiency and fairness of the claims-resolution process, and providing prompt rehabilitation and equitable compensation of medically injured persons. Portions of this document are not fully legible.

PB-224 281/6GA PC$4.25/MF$1.45
Macro Systems, Inc., Silver Spring, Md.
STRATEGIES FOR ACCOMMODATING AMBULATORY CARE PROJECTS UNDER MEDICARE AND MEDICAID.
Final rept.,
Robert Hamlin. Sep 72, 107p* HEW-ASPE-72-5
Contract HEW-OS-72-169

Descriptors: (*Public health, *Financing), (*Medical services, Management), Economic analysis, Financial management, Payment, Costraints, Cost engineering, Budgeting, Management engineering, Accounting.
Identifiers: Health services research and development, *Ambulatory care project, *Medicare, *Medicaid, Health services adminstration.

As one element of a strategy to stimulate better health services to under-served populations, Health Services and Mental Health Administration of Department of Health, Education and Welfare awarded developmental grants to several innovative forms of ambultory care centers. As centers matured, it was expected that they would generate income from other sources. In particular, it was expected that they would be able to derive a major share of their income requirements from Medicare and Medicaid reimbursements. These expectations have generally not been met. This study was to identify the extent of the shortfall and causes; and to identify ways in which HSMHA-funded ambulatory care centers can secure the maximum amount of third-party reimbursements to which they are legally entitled. Major constraints in third-party collections were found to center around provider status, benefit structures, patient eligibility, rate structures, and billing efficency. Clarification of the status of ambulatory care centers under the Medicare program is recommended; center performance in understanding benefit structures, cost accounting, and billing efficiency also must improve.

PB-224 385/5GA PC$4.50/MF$1.45
Center for Disease Control, Atlanta, Ga.
EVALUATION OF VISA MEDICAL ACTIVITIES.
Final rept.
25 Oct 72, 46p CDC-71-1
Report on Foreign Quarantine Program.

Descriptors: (*Foreign policy, *Public health), (*Medical examination, *Government policies), Psychoses, Mental disorders, Population migrations, Tuberculosis, Infectious deseases, National government, Drug addiction, Alcoholism, Handicapped workers, Detection, United States.
Identifiers: Aliens, Immigrants, Immigration, Waivers, Quarantine, Visas.

The Foreign Quarantine Program (FQP) of the Center for Disease Control is responsible for identifying from among aliens applying for immigrant status those who have any mental or physical defect specified in the Immigration Law. Three excludable conditions - mental retardation, previous attack(s) of insanity, and active tuberculosis - account for 95% of all visas refused on medical grounds; they also are the only conditions for which waivers are obtainable. This evaluation was undertaken to assure that the visa medical examination meets prescribed standards, determine if aliens who have been excluded for medical reasons are medically eligible for waivers, identify methods for improving delivery of the medical component (examination and waiver) of the visa issuence process, and assure that aliens admitted under waiver of excludability are integrated into the health care system best able to provide care and assistance. While the tuberculosis waiver and chest X-ray programs were found to function adequately, the mental waiver program is administratively complex and has not kept pace with modern medical knowledge or practice; program revision is recommended. (Author)

PB-224 403/6GA PC$6.75/MF$1.45
TransCentury Corp., Washington, D.C.
BRINGING MANAGEMENT INTO HEALTH CARE DELIVERY. ANALYSIS OF THE EHSDS IMPLEMENTATION YEAR.
Final rept.,
William G. Weissert. Jun 72, 94p HEW/HSMHA-71-8
Contract HSM-110-71-249

Descriptors: (*Medical services, Management planning), Management engineering, Communities, Urban areas, Organizations, Projects.
Identifiers: Health delivery systems, *Health services administration.

The Experimental Health Services Delivery Systems (EHSDS) was established by HSMHA in 1970 in order to develop effective ways in which communities can achieve equity of access to health care for their total populations. The program was to aid community efforts to identify health service needs and resources, develop in-

novations in their use of existing resources, develop linkages among services and resources, and to create an organization to direct and manage development of a system of health services. Evaluation of the twelve initial sites during their first year of operation revealed that unresolved planning year issues carried over into the implementation year--relationships with Regional Offices were inadequate and there was a failure to distinguish between Comprehensive Health Planning agency and EHSDS functions. In communities where no organization of key health actors existed, EHSDS introduced a forum for the rudiments of a system: interaction, discussion, examination, and agreement. Sites with a viable health group, however, received no support for programmatic activities.

PB-224 421/8GA PC$3.50/MF$1.45
Massachusetts General Hospital, Boston. Lab. of Computer Science.
PROGRAMMING LANGUAGES USED FOR HEALTH SCIENCES COMPUTER-ASSISTED INSTRUCTION,
Christopher R. Brigham. Aug 73, 66p* LHNCBC-74-01
Prepared in cooperation with Harvard Medical School, Boston, Mass.

Descriptors: (*Health, *Programmed instruction), (*Programming languages, Manuals), FORTRAN, BASIC programming language, PL/1 programming language, Clinical medicine, Pharmacology, Physiology, Dentistry, Radiology, Cardiology, Pharmacy, Biochemistry, Nursing, Hematology, Ophthalmology, Nutrition, Psychiatry, Veterinary medicine, Anatomy.
Identifiers: *Computer aided instruction, FOCAL programming language, APL programming language, MUMPS programming language, MIL programming language, MENTOR programming language, COURSEWRITER programming language, PILOT programming language, PRANIT programming language, TUTOR programming language, ATS programming language, FOIL programming language, CAISYS-8 programming language.

Twenty-three programming languages have been used to prepare health sciences computer- assisted instruction material. The report discusses the functional and technical characteristics of educational software, and examines individually fifteen languages. Factors influencing the suitability and compatability of computer languages are described, and recommendations are made about software development, use and standardization. (Author)

PB-224 483/8GA PC$6.75/MF$1.45
Little (Arthur D.), Inc., Cambridge, Mass.
EVALUATION OF THE EXPERIMENTAL MEDICAL CARE REVIEW ORGANIZATION PROGRAM: PROTOCOL FOR EVALUATION OF EMCRO. THIRD EDITION.
Final rept.,
Paul A. Bonner. Mar 73, 94p HEW-NCHSRD-72-2(b)
Contract HSM-110-72-269
See also report dated Mar 73, PB-220 617.

Descriptors: (*Medical services, Evaluation), Quality assurance, Physicians, Medical personnel, Hospitals, Nursing, Outpatient clinics, Organizations, Projects.
Identifiers: *Health services research and development, Experimental Medical Care Review Organization.

The Experimental Medical Care Review Organization (EMCRO) program was initiated in order to study the ability of regional medical appraisal programs to both improve the quality of medical care and moderate its cost. Grants were provided to selected local agencies to develop, document, and evaluate medical care review methods at the state and county level. The EMCRO evaluation protocol addresses questions concerning the impact of various EMCRO projects on the quality and cost of medical care and the relative cost-effectiveness or cost/benefits of different approaches to peer review. The protocol consists of a format for the collection and updating of information concerning the environment, organization, methods, and current status of each EMCRO project. Program reporting is based on development of a minimum common set of data, selected because of utility to the projects, to NCHSR and D, and to the implementation of Professional Standards Review Organizations (PSROs).

PB-224 522/3GA MF$1.45
National Academy of Sciences, Washington, D.C. Inst. of Medicine.
A STRATEGY FOR EVALUATING HEALTH SERVICES,
David M. Kessner, and Carolyn E. Kalk. Jul 73, 233p*
International Standard Book no. 0-309-02104-9.
Paper copy available from National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Ave., Washington, D.C. 20418. $6.00.

Descriptors: (*Medical services, Evaluation), Quality, Performance evaluation, Medical personnel, Hospitals, Outpatient clinics, Medical laboratories, Diagnosis, Therapy.
Identifiers: Health services administration.

Most of the nation's ill are treated as ambulatory patients, or outpatients, in physicians' offices or clinics. To evaluate the quality of care they receive this volume proposes the use of a set of specific health problems, or tracers, through which the strengths and weaknesses of medical facilities can be identified. The set of tracers described in the report includes middle ear infection, visual disorders, iron-deficiency anemia, hypertension, urinary tract infection, and cervical cancer. The book outlines the criteria used for selecting the tracers and describes the epidemiology and medical management criteria for each tracer presented. It then illustrates their use for evaluating ambulatory medical facilities to determine the effectiveness of case findings activities, screening and laboratory procedures, diagnosis, treatment, follow-up, management of referrals, and general medical management.

PB-224 537/1GA PC$3.00/MF$1.45
Duke Univ., Durham, N.C.
VALIDATION OF HUMAN EYE IRRITATION BY TEAR LYSOZYME LEVELS.
Final rept. 1 Jun 71-30 Jun 72,
Richard L. Pietsch. 29 Aug 72, 19p APTD-1362
Contract EPA-68-02-0096

Descriptors: (*Air pollution, Eye injuries), (*Eye injuries, *Smog), (*Body fluids, *Eye(Anatomy)), Ophthalmology, Experimental data, Questionnaires, Muramidase, Conjunctiva, Oxidizers, Degradation, Humans, Bioassay, Enzymes, Public health, California.
Identifiers: *Tears(Physiology).

Tear samples were collected from 358 volunteers in Southern California in smog polluted areas. No consistent variation of lysozyme concentration with oxidant concentration was demonstrated. Subjects exposed to .19 ppm of oxidant in the open air did show decreased lysis. A threshold effect is possible. No correlation was established between lysis and mild subjective complaints of irritation. Objective indications of eye irritation show a mild decrease in lysis levels.

PB-224 577/7GA PC$3.75/MF$1.45
North Carolina Univ., Chapel Hill. Mecklenburg Criminal Justice Pilot Project.
REHABILITATION POLICIES FOR HEROIN ADDICTS.
Discussion paper,
Gloria A. Grizzle. 6 Apr 73, 77p* MCJPP-57
Contract LEAA-NI-73-04-0002

Descriptors: (*Drug addiction, *Rehabilitation), (*Community relations, Therapy), Narcotics, Policies, Benefit cost analysis, Centers, North Carolina, Facilities.
Identifiers: Heroin addiction, Methadone maintenance, Day care, Charlotte(North Carolina).

Policy guidelines are outlined for community drug rehabilitation, along with cost-benefit analyses of methadone maintenance, therapeutic communities, and day treatment centers. In addition to treatment methods and their attendant costs and benefits, the results expected from different policies, and policies specifically appropriate for Charlotte-Mecklenburg are discussed. The size and cost of facilities required to treat heroin addicts in this area are considered.

PB-224 691/6GA PC$27.25/MF$1.45
National Institutes of Health, Bethesda, Md. Div. of Computer Research and Technology.
CARCINOGENESIS BIOASSAY DATA SYSTEM, PART I AND PART II.
Technical rept. 1968-73,
Mary S. Linhart, and Robert L. Martin. Jul 73, 505p DCRT-TR-73-10

Descriptors: (*Carcinogens, Bioassay), (*Information systems, Carcinogens), (*Malignant neoplasms, Information systems), Laboratory animals, Chemicals, Data processing, Data storage, Data retrieval, Computer programming.
Identifiers: *Biomedical information systems.

Volume I of this text is a complete discussion of Carcinogenesis Bioassay Data System (CBDS). It is of particular interest to administrators and bioassay investigators. Part II describes input and output data and procedures. Part III is a description of system programs. Part IV contains a glossary of words and phrases and code tables which are used by CBDS.

TT-72-56000/09/GA PC$3.50/MF$1.45
National Library of Medicine, Bethesda, Md.
MEDICAL JOURNAL. VOLUME 94, NUMBER 9, 1972.
1973, 65p
Trans. of Lijecnicki Vjesnik (Yugoslavia) v94 n9 p437-470 1972. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Medicine, *Yugoslavia), (*Periodicals, Medicine), Translations, Drug therapy, Leukemias, Neoplasms, Hospitals, Gamma globulin, Decompression sickness, Bone, Age, Sex, Cholecystitis, Mental disorders, Costs, Vitamin D group, Metabolism.

Contents:
- Chemotherapy of leukemia and the kinetics of tumor growth;
- Role of the microbiologist in the control of hospital infections;
- Serum and secretory immunoglobulins A;
- X-ray bone changes in caisson disease;
- Bone composition in relation to age and sex;
- Acute emphysematous cholecystitis;
- Economic cost of psychotic illness in Croatia, Yugoslavia;
- The cost of mental disease;
- New discoveries about the vitamin D metabolism.

6F. Environmental Biology

BMI-X-649/GA PC$48.75/MF$1.45
Battelle Columbus Labs., Ohio.
ECOLOGICAL AND ENVIRONMENTAL THESAURUS.
R. A. Mayer, J. A. Jefferis, M. A. Eischen, J. L. McBride, and R. S. Davidson. 30 Jun 73, 935p
Contract W-7405-eng-92

Descriptors: (*Ecology, *Standardized terminology), (*Environment, Standardized terminology), Air pollution, Health hazards, Human populations, Information retrieval, Information systems, Nuclear industry, Nuclear power plants, Radiation protection, Safety, Thermal pollution, Water pollution.

For abstract, see NSA 28 07, number 15478.

BNWL-SA-4614/GA PC$3.50/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
SOURCES AND INVENTORY OF RADIOACTIVITY IN THE AQUATIC ENVIRONMENT.
R. F. Foster. Jun 73, 26p CONF-730603-7
Contract AT(45-1)-1830

Descriptors: (*Surface waters, *Radioactivity), (*Columbia river, Radioactivity), Antimony 122, Aquatic ecosystems, Barium 140, Beryllium 7, Carbon 14, Cerium 144, Cesium 134, Cesium 137, Chromium 51, Clinch river, Cobalt 58, Cobalt 60, Contamination, Daughter products, Diffusion, Dresden-1 reactor, Environment, Fallout deposits, France, Fuel reprocessing plants, Hapo, Indian point-1 reactor, Iodine 131, Iron 55, Lake michigan, Liquid wastes, Manganese 54, Marine disposal, Natural radioactivity, Niobium 95, Nuclear industry, Nuclear ships, Ornl, Pacific ocean, Phosphorus 32, Potassium 40, Radioactive waste disposal, Radioactive wastes, Radionuclide migration, Radium 226, Rivers, Rubidium 87, Ruthenium 106, Savannah river, Savannah river plant, Scandium 46, Snap batteries, Strontium 89, Strontium 90, Technetium 99, Thorium 232, Tracer techniques, Tritium, United kingdom, Uranium 235, Uranium 238, Yttrium 91, Zinc 65, Zirconium 95.

For abstract, see NSA 28 07, number 15486.

COM-73-11645/1GA PC$3.00/MF$1.45
Oregon Fish Commission, Portland. Div. of Management and Research.
UMPQUA RIVER ESTUARY RESOURCE USE STUDY - 1971,
Tom Gaumer, Darrell Demory, and Laimons Osis. Jun 73, 28p NOAA-73090608
Contract DACW57-72-C-0138, NMFS-04-3-208-55

Descriptors: (*Umpqua River estuary, *Recreation), (*Fishing, Recreation), Estuaries, Oregon, Surveys, Marine fishes, Shellfish.

In 1971 the Fish Commission of Oregon studied the recreational use of marine food fish, shellfish, and miscellaneous invertebrates in the Umpqua River Estuary of Oregon. The anadromous sport fishery in the upper portion of the estuary was excluded. Marine resource maps were prepared using information from this and previous Fish Commission studies. Boat and shore anglers and tideflat users were interviewed for catch, effort, and angler origin data. Fish comprised 69% of the boat anglers' catch with striped bass the principal species caught. Fish represented 97% of the shore anglers' catch with Pacific tomcod the most common species caught. Softshell clams made up 100% of the tideflat users' take. Fifty-five percent of the resource users for the three fisheries were Oregon residents living outside of Douglas County. (Modified author abstract)

COM-73-11747/5GA Reprint
National Marine Fisheries Service, Galveston, Tex. Gulf Coastal Fisheries Center.
TESTING PENAEID SHRIMP FOR SUSCEPTIBILITY TO AN INSECT NUCLEAR POLYHEDROSIS VIRUS,
D. V. Lightner, R. R. Proctor, A. K. Sparks, J. R. Adams, and A. M. Heimpel. 26 Jan 73, 4p Contrib-353 NOAA-73092723
Prepared in cooperation with USDA Insect Pathology Lab., Beltsville, Md.
Pub. in Environmental Entomology, v2 n4 p611-613 Aug 73.

Descriptors: (*Shrimps, *Viruses), Tolerances(Physiology), Shellfish, Insects, Insect control.
Identifiers: Penaeus aztecus, Penaeus setiferus, Autographa californica, Brown shrimp, White shrimp, Biological insect control.

Postlarval, early, and late juvenile stages of two species of penaeid shrimp, Penaeus aztecus Ives and Penaeus setiferus (L.), were tested for susceptibility to a nuclear polyhedrosis virus from Autographa californica (Speyer). Shrimp were exposed to the virus by intramuscular inoculation of polyhedral protein-free virus and by feeding a diet containing virus polyhedra. Mortality attributable to viral infection did not occur during the 30-day test period, nor was there histological evidence of viral activity in shrimp hepatopancreas, gut, gill, striated muscle, ventral nerve, and segment nerve ganglia, or hypodermis. (Author)

CONF-721227-1/GA PC$3.25/MF$1.45
Oak Ridge National Lab., Tenn.
SUITABILITY INDICES FOR EVALUATING HIGHWAY ROUTE ALTERNATIVES.
H. H. Jr. Shugart. 21p

Descriptors: (*Ecosystems, *Mathematical models), Comparative evaluations, Environment.

For abstract, see NSA 28 07, number 17735.

CONF-730505-7/GA PC$3.50/MF$1.45
Wisconsin Univ., Madison.
MODELING THE EFFECTS OF TEMPERATURE CHANGES ON THE ECOLOGY OF RANA PIPIENS AND THAMNOPHIS SIRTALIS.
W. P. Porter, and C. R. Tracy. May 73, 27p

Descriptors: (*Frogs, *Ecology), (*Snakes, Ecology), (*Lizards, Ecology), Biological models, Climates, Ecosystems, Ecosystems, Energy, Meteorology, Populations, Temperature dependence, Thermal effluents, Thermal pollution.

For abstract, see NSA 28 07, number 17736.

CONF-730817-2/GA PC$3.50/MF$1.45
Oak Ridge National Lab., Tenn.
RADIOISOTOPE TECHNIQUES IN DELINEATION OF THE ENVIRONMENTAL BEHAVIOR OF CADMIUM.
R. I. Jr. Van Hook, B. G. Blaylock, E. A. Bondietti, C. W. Francis, and J. W. Huckabee. 1973, 28p SM-175/22

Descriptors: (*Cadmium, *Toxicity), (*Ecosystems, *Tracer techniques), Cadmium 109, Distribution, Environment, Food chains, Plants, Sediments, Soils.

For abstract, see NSA 28 08, number 20610.

COO-1332-88/GA PC$3.00/MF$1.45
Minnesota Univ., St. Paul.
RAPTOR REHABILITATION AND CONSERVATION IN MINNESOTA.
M. R. Fuller, P. T. Redig, and G. E. Duke. 1973, 17p CONF-730340-2

Descriptors: (*Birds, *Ecology), Environment, Injuries, Minnesota, Populations, Reproduction.

For abstract, see NSA 28 08, number 20611.

COO-1332-90/GA PC$12.25/MF$1.45
Minnesota Univ., St. Paul.
ECOLOGY OF BARRED OWLS AS DETERMINED BY AN AUTOMATIC RADIO-TRACKING SYSTEM.
T. H. Nicholls. Aug 73, 205p

Descriptors: (*Birds, *Behavior), Ecology, Telemetry.

For abstract, see NSA 28 07, number 17747.

COO-1332-95/GA PC$5.00/MF$1.45
Minnesota Univ., Minneapolis. James Ford Bell Museum of Natural History.
EFFECTS OF IONIZING RADIATION AND OTHER ENVIRONMENTAL FACTORS ON BREEDING BEHAVIOR, ACTIVITY PATTERNS, AND MOVEMENT OF SELECTED VERTEBRATES. PROGRESS REPORT, JULY 1, 1972--JUNE 30, 1973.
J. R. Tester. Jul 73, 58p
Contract AT(11-1)-1332

Descriptors: (*Wild animals, *Biological radiation effects), Acute irradiation, Age dependence, Behavior, Biological variability, Environment, Gamma radiation, Mammals, Radiation doses, Radiosensitivity, Survival time, Terrestrial ecosystems.

For abstract, see NSA 28 07, number 15731.

COO-2003-18/GA PC$7.75/MF$1.45
Michigan Univ., Ann Arbor. Great Lakes Research Div.
LIMNOLOGICAL SURVEY OF LAKES MICHIGAN, SUPERIOR, HURON, AND ERIE. PUBLICATION NO. 17.
C. L. Schelske, and J. C. Roth. 1973, 113p
Contract AT(11-1)-2003

Descriptors: (*Lake huron, *Ecology), (*Lake michigan, Ecology), (*Lake superior, Ecology), (*Lake erie, Ecology), Fresh water, Hydrology, Hydrosphere.

For abstract, see NSA 28 07, number 17749.

COO-2115-4/GA PC$6.25/MF$1.45
Colorado State Univ., Fort Collins.
STATISTICAL STUDY OF BASIC ECOLOGICAL VARIATIONS IN A SHORTGRASS PRAIRIE SITE. FINAL REPORT, SEPTEMBER 14, 1972--JUNE 30, 1973.
C. D. Bonham. 1973, 85p
Contract AT(11-1)-2115

Descriptors: (*Plants, *Biological variability), Computer calculations, Distribution, Geography, Grass, Statistical models, Terrestrial ecosystems.

For abstract, see NSA 28 08, number 20612.

COO-2164-7/GA PC$3.25/MF$1.45
Michigan Univ., Ann Arbor (Usa). Dept. Of Botany.
ENERGY EXCHANGE WITHIN ECOSYSTEMS. SECOND ANNUAL TECHNICAL PROGRESS REPORT, SEPTEMBER 1, 1972--AUGUST 31, 1973.
D. M. Gates. 13 Jun 73, 24p
Contract AT(11-1)-2164

Descriptors: (*Aquatic ecosystems, *Energy transfer), Animals, Meteorology, Physiology, Plants.

For abstract, see NSA 28 07, number 17750.

COO-3279-6/GA PC$8.50/MF$1.45
Johns Hopkins Univ., Baltimore, MD.
ECOLOGY OF THE PLANKTON OF THE CHESAPEAKE BAY ESTUARY. PROGRESS REPORT, SEPTEMBER 1, 1972--JUNE 30, 1973.
W. R. Taylor. 1973, 128p
Contract AT(11-1)-3279

Descriptors: (*Plankton, *Ecology), (*Chesapeake bay, Plankton), Algae, Crustaceans, Edta, Estuaries, Nutrients, Phosphorus.

For abstract, see NSA 28 08, number 20614.

EDFB-IBP-72-12/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.

MODEL OF SEASONAL CHANGES IN TOTAL NITROGEN CONCENTRATION IN THE LAKE WINGRA WATER COLUMN.
E. H. Dettmann. May 73, 35p
Contract W-7405-eng-26

Descriptors: (*Lakes, *Ecology), (*Nitrogen, *Seasonal variations), Aquatic ecosystems, Metabolism, Terrestrial ecosystems, Wisconsin.

For abstract, see NSA 28 07, number 17759.

EDFB-IBP-73-5/GA PC$18.75/MF$1.45
Oak Ridge National Lab., Tenn.
EASTERN DECIDUOUS FOREST BIOME, US--IBP. PROGRESS REPORT, 1971--1972.
R. L. Burgess, and L. H. Kern. Jul 73, 332p
Contract W-7405-eng-26

Descriptors: (*Forests, *Research programs), (*Ecosystems, Research programs), Aquatic ecosystems, Biological models, Data, Documentation, Hydrology, Meteorology, Terrestrial ecosystems.

For abstract, see NSA 28 07, number 17760.

EDFB-IBP-73-6/GA PC$7.60/MF$1.45
Oak Ridge National Lab., Tenn.
TERRESTRIAL PRIMARY PRODUCTION. PROCEEDINGS OF INTERBIOMED WORKSHOP ON GASEOUS EXCHANGE METHODOLOGY, OAK RIDGE NATIONAL LABORATORY, APRIL 13-14, 1972.
B. E. Dinger, and W. F. Harris. Jul 73, 184p
CONF-720478-
Contract W-7405-eng-26

Descriptors: (*Photosynthesis, *Biochemical reaction kinetics), Carbon dioxide, Ecology, Measuring methods, Meetings, Metabolism, Oxygen, Plants, Proceedings, Respiration, Terrestrial ecosystems.

For abstract, see NSA 28 08, number 20615.

ORNL-NSF-EP-42/GA PC$9.00/MF$1.45
Oak Ridge National Lab., Tenn.
MATERIAL RESOURCES AND RECYCLING. REPORT OF PROGRESS, JANUARY 1, 1971--JUNE 15, 1972.
Jul 73, 136p
Contract W-7405-eng-26

Descriptors: (*Environment, *Research programs), (*Waste management, Research programs), (*Cadmium, *Food chains), (*Mercury, Food chains), Ecosystems, Toxicity, X-ray fluorescence analysis.

For abstract, see NSA 28 07, number 17788.

ORNL-4893/GA PC$7.60/MF$1.45
Oak Ridge National Lab., Tenn.
DYNAMICS OF LITTER DECOMPOSITION, MICROBIOTA POPULATIONS, AND NUTRIENT MOVEMENT FOLLOWING NITROGEN AND PHOSPHORUS ADDITIONS TO A DECIDUOUS FOREST STAND.
J. M. Kelly. Jul 73, 214p
Contract W-7405-eng-26

Descriptors: (*Trees, *Nutrients), Biological materials, Decomposition, Diffusion, Fertilizers, Forests, Leaves, Microorganisms, Nitrogen, Phosphorus, Terrestrial ecosystems.

For abstract, see NSA 28 07, number 17786.

ORO-4254-9/GA PC$3.25/MF$1.45
Oklahoma State Univ., Stillwater. Los Alamos Scientific Lab., N. Mex.
COMPARTMENTED AQUATIC MODEL OF THE RELATIONSHIP BETWEEN CARBONATE AND NITRATE IN A GREAT PLAINS RESERVOIR.
L. P. Varga, G. K. Rice, D. W. Toetz, and E. D. Loughran. 1973, 23p CONF-730445-1
Contract AT(40-1)-4254

Descriptors: (*Nitrogen, *Uptake), (*Plankton, *Photosynthesis), (*Aquatic ecosystems, *Mathematical models), Carbonates, Compartments, Oxygen, Temperature dependence, Visible radiation.

For abstract, see NSA 28 07, number 17794.

PB-224 462/2GA PC-GPO/MF$1.45
Minnesota Univ., Minneapolis. Limnological Research Center.
RATES OF PHOTOSYNTHESIS AND PHYTOPLANKTON GROWTH IN SHAGAWA LAKE, MINNESOTA.
Ecological research series,
Robert O. Megard. Jul 73, 70p W74-00151, EPA-R3-73-039
Paper copy available from GPO $0.95 as stock no. EP1.23:73-039.

Descriptors: (*Shagawa Lake, *Primary biological productivity), Minnesota, Lakes, Water pollution, Sewage, Phytoplankton, Photosynthesis, Algae, Nutrients, Absorption(Biology), Inorganic, Chlorophylls.
Identifiers: *Eutrophication, Aphanizomenon.

Integral photosynthetic rates and growth rates of phytoplankton were measured before, during, and after a bloom of Aphanizomenon, which occurred in August 1970. The size of the population increased during the bloom despite decreasing specific production rates, probably because the dominant algal became more buoyant and decreased its sinking rate. The effects of changing the specific production rates and specific loss rates are demonstrated by comparing the integral photosynthetic rates and chlorophyll concentrations that would prevail under steady state conditions.

PRNC-162/GA PC$15.25/MF$1.45
Puerto Rico Nuclear Center, San Juan.
AGUIRRE POWER PROJECT ENVIRONMENTAL STUDIES 1972 ANNUAL REPORT.
Mar 73, 264p
Contract AT(40-1)-1833

Descriptors: (*Puerto rico, *Ecology), (*Aguirre-1 reactor, *Environment), Algae, Birds, Corals, Fishes, Grass, Plankton, Protozoa, Reactor sites.

For abstract, see NSA 28 08, number 18244.

RLO-2225-T-18-4/GA PC$3.00/MF$1.45
Washington Univ., Seattle. Lab. Of Radiation Ecology.
STUDIES OF CONCENTRATIONS OF UNREPORTED LONG-LIVED RADIONUCLIDES IN BIOTA AND OCEAN SEDIMENTS AT BIKINI AND ENIWETOK ATOLLS. ANNUAL PROGRESS REPORT, 1972--1973.
W. R. Schell. 1 May 73, 19p
Contract AT(45-1)-2225

Descriptors: (*Bikini, *Radiation monitoring), (*Americium 241, Radiation monitoring), (*Alpha sources, Radiation monitoring), (*Seawater, *Radiometric analysis), Depth, Radionuclide migration, Sample preparation, Sediments, Separation processes.

For abstract, see NSA 28 07, number 15485.

RLO-2225-T-26-10/GA PC$4.50/MF$1.45
Washington Univ., Seattle. Dept. Of Oceanography.
BENTHIC COMMUNITY METABOLISM ON THE CONTINENTAL TERRACE AND IN THE DEEP SEA IN THE NORTH PACIFIC.
M. M. Pamatmat. 1972, 50p

Descriptors: (*Pacific ocean, *Ecology), Animals, Aquatic ecosystems, Metabolism, Nutrients, Oxygen, Plants.

For abstract, see NSA 28 07, number 17798.

TID-26360/GA PC$3.00/MF$1.45
Massachusetts Univ., Gloucester. Marine Station.
INTERRELATIONSHIP BETWEEN CERTAIN HYDROGRAPHIC FEATURES ASSOCIATED WITH CURRENTS AND PRIMARY PRODUCTION. PROGRESS REPORT, SEPTEMBER 1, 1972--AUGUST 31, 1973.
C. S. Yentsch. 1973, 7p
Contract AT(11-1)-3024

Descriptors: (*Plankton, *Plant growth), Biological models, Coastal waters, Hydrology, Nutrients, Temperature dependence, Visible radiation.

For abstract, see NSA 28 07, number 17818.

UCLA-12-805/GA PC$6.75/MF$1.45
California Univ., Los Angeles. Lab. Of Nuclear Medicine and Radiation Biology.
ENERGY METABOLISM OF FOUR SPECIES OF DESERT RODENTS IN THEIR NATURAL ENVIRONMENTS.
R. K. Mullen. Jan 71, 91p
Contract AT(04-1)-Gen-12

Descriptors: (*Rodents, *Metabolism), Biological effects, Carbon dioxide, Climates, Deserts, Environment, Excretion, Oxygen, Physiology, Respiration, Terrestrial ecosystems, Tracer techniques, Wild animals.

For abstract, see NSA 28 08, number 20653.

UCLA-12-916/GA PC$10.60/MF$1.45
California Univ., Los Angeles. Lab. Of Nuclear Medicine and Radiation Biology.
SOME CHARACTERISTICS OF SOIL AND PERENNIAL VEGETATION IN NORTHERN MOJAVE DESERT AREAS OF THE NEVADA TEST SITE.
E. M. Romney, V. Q. Hale, A. Wallace, O. R. Lunt, and J. D. Childress. Jun 73, 340p
Contract AT(04-1)-Gen-12

Descriptors: (*Nevada test site, *Terrestrial ecosystems), Cesium 137, Chemical composition, Deserts, Environment, Leaves, Minerals, Nutrients, Plant stems, Plants, Potassium 40, Radionuclide migration, Soils, Thorium, Uptake, Uranium.

For abstract, see NSA 28 08, number 18245.

UCLA-34-P-134-7/GA PC$14.50/MF$1.45
California Univ., Los Angeles.
BIOLOGICAL CYCLING OF ELEMENTS AND STABLE ISOTOPES IN MARINE ENVIRONMENTS. PROGRESS REPORT, APRIL 1, 1972--MAY 1, 1973.
I. R. Kaplan. 1973, 247p
Contract AT(04-3)-34

Descriptors: (*Seas, *Biogeochemistry), (*Elements, *Dispersions), (*Uranium, *Activation analysis), (*Sulfates, *Quantitative chemical analysis), Aquatic ecosystems, Metabolism, Nutrients, Oceanography, Seawater, Sediments, Water pollution.

For abstract, see NSA 28 08, number 18247.

UCSD-10-P-20-152/GA PC$37.75/MF$1.45
California Univ., la Jolla. Inst. Of Marine Resources.

RESEARCH ON THE MARINE FOOD CHAIN. PROGRESS REPORT, JULY 1972--JUNE 1973. PART I. INTRODUCTION AND ACCOUNT OF WORK IN PROGRESS. PART II. MANUSCRIPT REPORTS OF WORK CONCLUDED. PART III. DATA RECORD.
1973, 711p
Contract AT(11-1)-GEN-10

Descriptors: (*Pacific ocean, *Food chains), (*Tritium, *Diffusion), (*Antarctic regions, *Fallout deposits), Algae, Aquatic ecosystems, Carbon, Crustaceans, Distribution, Invertebrates, Nitrogen, Nutrients, Photosynthesis, Plankton, Plants, Radiation monitoring, Sampling, Seawater.

For abstract, see NSA 28 07, number 15487.

6G. Escape, Rescue, and Survival

N73-30339/8GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GRAN EXPERIMENT.
J. C. Morakis, C. Cote, G. Orr, and L. Roach. Mar 73, 39p NASA-TM-X-70437, X-752-73-198

Descriptors: *Rescue operations, *Systems engineering, Data processing, Real time operation, Syncom satellites.

For abstract, see STAR 1121

PATENT-3 497 889/GA Not available NTIS
Department of the Navy Washington D C
INFLATABLE LIFE PRESERVER.
Patent,
John J. Mellin, Jr., Johathan Harding, William T. Schrandt, and Carmela M. Filippino. Filed 21 Mar 68, patented 3 Mar 70, 5p Rept nos. PAT-APPL-714 824,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Life preservers, *Patents), Inflatable structures, Marine safety equipment, Sea rescue equipment.
Identifiers: PAT-CL-9-340.

The present invention relates to a life preserver having a pair of separate independently inflatable flotation compartments consisting of a collar lobe and two interconnected body lobes. In its deflated condition the preserver is enclosed in a T-shaped supporting cover to form a single integrated unit which is worn around the waist, up the back and which substantially encircles the neck to provide complete unencumbered operational movement for the wearer.

6H. Food

AEC-tr-7436/GA PC$6.25/MF$1.45
TECHNOLOGY OF INHIBITION OF SPROUTING OF POTATOES BY MEANS OF RADIATION. REPORT ON LABORATORY TESTS IN THE 1969--1970 CAMPAIGN.
F. Sandert. 1971, 85p
Translation of Technologie de la radio-inhibition de la germination des pommes de terre. Rapport sur les essais de laboratoire de la campagne 1969--70.

Descriptors: (*Potatoes, *Radiopreservation), Gamma radiation, Organoleptic properties, Sprout inhibition, Wholesomeness.

For abstract, see NSA 28 07, number 15672.

AEC-tr-7437/GA PC$5.50/MF$1.45
STUDY OF POSSIBILITIES OF USING IRRADIATION TO DECONTAMINATE SPICES.
L. G. M. van Dijk. 1970, 68p
Translation of Etude des possibilites d'application de l'irradiation a la decontamination des epices.

Descriptors: (*Spices, *Radiopreservation), Gamma radiation, Irradiation, Microorganisms, Organoleptic properties, Packaging, Radiation doses, Sterilization, Storage.

For abstract, see NSA 28 08, number 18444.

COM-73-11596/6GA Reprint
National Marine Fisheries Service, Seattle, Wash. Northwest Fisheries Center.
PROBLEMS DISCOURAGING USE OF FISH OIL IN AMERICAN-MANUFACTURED SHORTENING AND MARGARINE,
Maurice E. Stansby. 24 Jan 73, 5p NOAA-73081716
Pub. in Jnl. of the American Oil Chemists Society, v50 n6 p220A-225A Jun 73.

Descriptors: (*Food, Oils), Margarine, Fishes, Standards.
Identifiers: Fish oil.

A variety of reasons are given by members of the American shortening industry for the failure to use fish oil as raw material. Some of the reasons are: flavor reversion, quality is less uniform than that of others, the public image of fish oil, price, legal restrictions, and miscellaneous technical problems. Price seems to be the most critical factor in determining the possibility of using hydrogenated fish oils in edible fats of American manufacture.

COM-73-11661/8GA Reprint PC$3.00
National Marine Fisheries Service, College Park, Economic Research Lab.
WORLD SUPPLIES OF ANIMAL PROTEIN,
Bruce R. Stillings. 1973, 14p NOAA-73073015
Pub. in Proteins in Human Nutrition, chpt. 2 p11-33 1973.

Descriptors: (*Food supply, Proteins), Nutrition, Diets, Marine fishes, Fishes, Pollution, Availability.
Identifiers: *Animal proteins.

The author reviews the dietary requirements for animal protein and presents an assessment of the production and supplies of animal protein in various regions of the world during the past two decades. The potential for increasing global supplies in the future is also considered. It is suggested that the potential for increasing available protein from fish in the future rests either in increasing the fish catch or in more efficient utilization of the protein harvest. The author cautions that unless the problem of pollution of the oceans receives immediate and serious attention, however, the supplies of fish protein for human consumption may fall considerably below the predicted potential.

COM-73-11709/5GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
FOOD PACKAGING AND STORAGE. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1970-Sep 73,
Edward J. Lehmann. Oct 73, 118p* NTIS-WIN-73-059
Supersedes NTIS-PK-5.

Descriptors: (*Food storage, *Bibliographies), (*Food packaging, Bibliographies), Food contamination, Freeze drying, Canning, Irradiated food, Sterilization, Food preservation, Refrigeration, Freezing.

The NTISearch bibliography contains 112 selected abstracts of research reports retrived using the NTIS on-line search system--NTISearch. The abstracts cover almost four years of research on food packaging and storage. The topics cover such areas as food irradiation, package contamination, freezing, freeze drying, refrigeration, and nutrition losses. (Author)

COM-73-11737/6GA PC$6.75/MF$1.45
Boston Coll., Chestnut Hill, Mass. Office of Special Programs.
NATIONAL SURVEY OF THE OYSTER INDUSTRY'S PROBLEMS.
Final rept.,
Charles L. Vaughn. 15 May 73, 92p NOAA-73100402
Grant NOAA-043-41-72
Sponsored in part and prepared in cooperation with Shellfish Inst. of North America, Baltimore, Md.

Descriptors: (*Oysters, *Food industry), Seafood, Pollution, Surveys, Supply(Economics), Value, Estimates, Manpower.

The National Survey of the Oyster Industry's Problems is based upon questionnaire returns from three waves of mailings during the latter half of 1972 to all 523 known oyster producers in the United States, as determined from lists furnished by the Statistics and Market News Division, National Marine Fisheries Service, and from forty face-to-face personal interviews with these producers. Results presented in some 21 tables in the report are generally based upon completed questionnaires from a total of 192 oyster producers. The results indicate that oyster producers are most often and most seriously concerned with problems of supply and of production. Most seriously affecting supply is the problem of pollution and most seriously affecting production is the shortage of labor.

COM-73-11739/2GA PC$4.75/MF$1.45
Washington Univ., Seattle. Graduate School of Business Administration.
AN EVALUATION OF THE MARKET FOR PAN-SIZED SALMON,
Louis C. Wagner. Nov 72, 55p NOAA-73100403

Descriptors: (*Salmon, *Marketing), Food industry, Competition, Evaluation, Trout.

Most of the information regarding the initial market acceptance of pan-sized salmon or baby salmon was secured by interviewing brokers, wholesalers, and restaurants which had placed the product on their menus as well as other eating establishments which had been exposed to the product but did not use it. The popularity of pan-sized salmon varied widely. Two significant factors appeared to be the enthusiasm of the chef for the item and the way it was featured on the menu. Criticism of product quality was not a factor influencing restaurants not to offer the product. Competition of fresh regular salmon or lower-priced trout, small volume, lace of a boned product, and waiting for menu change were most frequent deterents to use.

COM-73-11742/6GA PC$7.25/MF$1.45
Oregon State Univ., Corvallis. School of Business and Technology.
THE MARKETING OF SNOW CRAB.
May 73, 101p NOAA-73100401

Descriptors: (*Crabs, Marketing), Surveys, Food industry, Demand(Economics), Management, Food consumption, Statistical data, Food processing.
Identifiers: Snow crabs.

The study provides an overview of the problems involved in marketing Snow crab. Market acceptance of Snow crab is weak. The organization of the marketing channel appears haphazard and directionless. Two types of problems are identified: those inherent in the Snow crab itself as a product, and those created by the trade relationships within the channel. It is suggested that there ought to be an industry-wide effort to understand how the consumer uses Snow crab both as a nutritional and a social vehicle, to translate these into specific products which can be offered to meet these needs. These product offerings should be communicated through a managed promotional

campaign to reach both the trade and the final consumer, both for potential demand for meals at home and in restaurants.

COM-73-11750/9GA Reprint
Oregon State Univ., Astoria. Seafoods Lab.
POSTMORTEM QUALITY CHANGES IN ICED PACIFIC SHRIMP ('PANDALUS JORDANI'),
Sergio C. Flores, and David L. Crawford. 1973, 6p NOAA-73100305
Grant NOAA-043-158-4
Also pub. as Oregon State Univ., Corvallis. Agricultural Experiment Station, Technical Paper-3478. Prepared in cooperation with Monterrey Inst. of Technology, Sonoro, Mexico.
Pub. in Jnl. of Food Science, v38 p575-579 1973.

Descriptors: (*Shrimps, Freezing), (*Food storage, Shrimps), Quality, Food processing, Bacteria, pH, Proteins, Amino acids, Dimethylamine, Vitamins, Flavor.
Identifiers: Sea Grant program, Pandalus jordani, Trimethylamine.

The article reports on an investigation undertaken to develop information on the postmortem biochemical changes that take place in iced Pacific shrimp and to evaluate the relationship between these changes and the quality of the cooked product. It was found that there was a progressive increase in pH from 7.6 to 8.8 for intact shrimp during eight days of iced storage. The pH of the cooked meat paralleled these changes closely. Microbial numbers in the storage test increased while total nitrogen and NPN content of intact shrimp decreased with iced storage. A similar decrease, although variable, was found for samples of the cooked meat. A decrease of total carotenoid content was observed in both the intact shrimp and cooked meat during the first two days of storage. Tyrosine levels increased during the first two days of iced storage and in the cooked meat during storage.

COM-73-11781/4GA Reprint
North Carolina State Univ., Raleigh. Dept. of Food Science.
EFFECT OF SANITATION PROCEDURES ON BACTERIAL LEVELS IN BLUE CRAB PROCESSING PLANTS,
N. B. Webb, S. J. Stokes, F. B. Thomas, N. B. Moncol, and E. R. Hardy. 1973, 7p NOAA-73100101
Contract NOAA-2-35178
Pub. in Proceedings of the Gulf and Caribbean Fisheries Institute (25th Annual session) p109-114 May 73.

Descriptors: (*Crabs, *Food processing), Bacteria, Food sanitation, Microorganisms, Sampling, Food industry.
Identifiers: Sea Grant program.

The seafood industry needs additional effort on the control of microorganisms. During the processing of crabmeat, there is a possibility that large numbers of bacteria may be brought into the plant on the raw product and by the workers. Also, a serious increase in bacteria can occur if adequate sanitary practices are not used throughout the plant. This laboratory has previously made studies on the level and types of microorganisms occurring in commercial crabmeat. However, a detailed study of in-plant levels needs to be accomplished. Once the levels have been established and problem areas identified, methods of control can be established. This investigation involved the examination of the microbial level and an appraisal of the in-plant sanitation conditions at various points throughout the processing cycle. The object of this study was to establish levels of microbial organisms found in the finished product and throughout the processing operation. (Author)

COM-73-11785/5GA Reprint
Oregon State Univ., Astoria. Seafoods Lab.
QUANTITATIVE CHANGES IN WHOLE MYOFIBRILS AND MYOFBRILLAR PROTEINS DURING FROZEN STORAGE OF TRUE COD.
Research note,
Ernest A. Childs. 1973, 3p NOAA-73100303
Grant NOAA-043-158-4
Also pub. as Oregon State Univ., Corvallis. Agricultural Experiment Station, Technical Paper-3516.
Pub. in Jnl. of Food Science, v38 p718-719 1973.

Descriptors: (*Cod, *Freezing), (*Proteins, Freezing), Muscles, Fishes, Food processing, Food storage, Seafood.
Identifiers: Sea Grant program, Myofibrils, Gadus macrocephalus.

The research note reports experiments undertaken to determine if there is a decrease in the quantity of whole myofibrils which can be extracted from frozen, stored fish portions; and if the decrease correlates with decreases in total myofibrillar protein extractability. Results suggest that during frozen storage of true cod the extractability of whole myofibrils decreased more rapidly than the combined extractability of component myofibrillar protein.

COM-73-11795/4GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
FOOD PROCESSING. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept for 1969-Sep 73,
Elizabeth A. Harrison. Oct 73, 114p* NTIS-WIN-73-072
Supersedes NTIS-PK-6.

Descriptors: (*Food processing, *Bibliographies), Canning, Feeding stuffs, Shellfish, Vegetables, Seafood, Food additives, Freezing, Dehydrated foods, Freeze drying, Fish protein concentrates, Food irradiation.

The NTISearch bibliography contains 109 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The abstracts include all types of food processing but primarily cover food irradiation, fish protein processing, and freeze drying. (Author)

COM-73-11820/0GA Reprint
Oregon State Univ., Corvallis. Dept. of Food Science and Technology.
WHAT SEAFOOD PROCESSORS SHOULD KNOW ABOUT 'VIBRIO PARAHAEMOLYTICUS',
J. S. Lee. 16 Mar 73, 5p NOAA-73100304
Grant NOAA-043-158-4
Also pub. as Oregon State Univ., Corvallis. Agricultural Experiment Station, Technical Paper-3549.
Pub. in Jnl. of Milk and Food Technology, v36 n8 p405-408 Aug 73.

Descriptors: (*Seafood, Food processing), (*Food processing, *Bacteria), (*Enteritis, Gastritis), Food poisoning, Food sanitation, Sodium chloride, Fishes, Temperature, Disinfection, pH.
Identifiers: *Vibrio parahaemolyticus, Sea Grant program.

Repeated outbreaks of gastroenteritis, caused by Vibrio parahaemolyticus in the United States point to the need for control measures. Information on Vibrio parahaemolyticus that is pertinent for its control in food processing operations is compiled and discussed in this paper. The growth potential of this organism and requirement for NaCl are discussed in some detail. Effects of temperature, pH, and antimicrobial agents are also presented.

COO-1689-8/GA PC$11.25/MF$1.45
Michigan State Univ., East Lansing. Dept. Of Food Science and Human Nutrition.
RADIATION PASTEURIZATION OF FRESH MEATS AND POULTRY. ANNUAL REPORT, JUNE 15, 1971--JUNE 15, 1972.
W. M. Urbain. Jun 72, 182p
Contract AT(11-1)-1689

Descriptors: (*Meat, *Radiopreservation), Leading abstract.

For abstract, see NSA 28 08, number 18445.

COO-1689-9/GA PC$4.25/MF$1.45
Michigan State Univ., East Lansing. Dept. Of Food Science and Human Nutrition.
RADIATION PASTEURIZATION OF FRESH MEATS AND POULTRY. ANNUAL REPORT, JUNE 16, 1972--JUNE 30, 1973.
W. M. Urbain. Jun 73, 45p
Contract AT(11-1)-1689

Descriptors: (*Meat, *Radiopreservation), Biochemical reaction kinetics, Color, Dose rates, Gamma radiation, Irradiation, Oxygen, Packaging, Radiation doses.

For abstract, see NSA 28 08, number 18450.

EUR-3945(Pt.3)/GA PC$3.75/MF$1.45
Pavia Univ. (Italy). Istituto d'Igiene.
COMPARISON OF THE RADIOACTIVE CONTAMINATION OF THE TOTAL DIET OF ADOLESCENTS IN THE COMMUNITY. III. ANALYSIS OF FOOD CONSUMPTION IN THE INSTITUTIONAL DIET PROGRAMME.
E. Lanzola, and A. Marinoni. Jun 73, 31p
U.S. Sales Only.

Descriptors: (*European communities, *Diet), Adolescents, Calcium, Cereals, Cheese, Lipids, Meat, Milk, Nutrition, Potatoes, Proteins, Seafood, Statistics.

For abstract, see NSA 28 08, number 18236.

EUR-4965/GA PC$4.25/MF$1.45
International Atomic Energy Agency, Vienna (Austria). Div. Of Research and Labs. European Communities, Luxembourg. Commission.
RAPID DETERMINATION OF RADIONUCLIDES IN MILK. RESULTS OF AN INTERCOMPARISON ORGANIZED JOINTLY BY THE I.A.E.A. AND C.E.C. IN 1972.
O. Suschny, J. Heinonen, D. Merten, J. Smeets, and R. Amavis. May 73, 45p
U.S. Sales Only.

Descriptors: (*Milk, *Contamination), (*Barium 140, *Radiation monitoring), (*Cesium 137, Radiation monitoring), (*Iodine 131, Radiation monitoring), Comparative evaluations, Euratom, Food chains, Human populations, Human populations, Iaea, Radiation hazards, Radiation protection, Radiometric analysis, Strontium 89, Strontium 90.

For abstract, see NSA 28 08, number 18237.

N73-31012/0GA PC$8.00/MF$1.45
Purdue Univ., Lafayette, Ind.
HEATING OF FOOD IN MODIFIED ATMOSPHERES.
Final Report.
V. E. Sweat. 1973, 116p NASA-CR-134040
Contract NAS9-10823

Descriptors: *Atmospheric composition, *Food, *Heating, *Pressure effects, Heating equipment, Helium-oxygen atmospheres, Nitrogen, Nutrition.

For abstract, see STAR 1122

PB-224 437/4GA MF$1.45
National Research Council, Washington, D.C. Committee on Food Protection.

THE USE OF CHEMICALS IN FOOD PRODUCTION, PROCESSING, STORAGE, AND DISTRIBUTION.
Jul 73, 40p*
International Standard Book No. 0-309-02136-7.
Paper copy available from National Academy of Science, Printing and Publishing Office, 2101 Constitution Ave., Washington, D.C. 20418 $2.25.

Descriptors: (*Food additives, Reviews), Pesticides, State government, National government, Regulations, Legislation, Food processing, Food storage, Impurities.

This report considers the purpose and technologic benefits of common types of intentional food additives--acids, alkalies, buffers, and neutralizing agents; emulsifying, stabilizing, and thickening agents; flavoring materials; food colors; nutrient supplements; preservatives and antioxidants; and selected miscellaneous types. Also described are chemicals occurring naturally in foods and the incidental incorporation of chemicals through the use of certain packaging materials, pesticides and fertilizers in crop production, and feed adjuvants and drugs in animal production. The report emphasizes both the responsibilities of industry and the functions of federal and state agencies in assuring the safe use of food additives. A summary of legislative measures enacted to ensure protection of the public is included.

PB-224 816/9GA PC$3.25/MF$1.45
Commonwealth Scientific and Industrial Research Organization, North Ryde (Australia). Div. of Food Research.
QUALITY TESTS OF SOME NEW AND STANDARD POTATO VARIETIES,
D. McG. McBean, G. G. Coote, and Elizabeth M.Christie. 1973, 24p Technical Paper-36
International Standard Book no. 0-643-00081-X.

Descriptors: (*Potatoes, *Food analysis), (*Agronomy, Australia), Vegetable crops, Selection, Color, Texture, Flavor, Specific gravity, Food chemistry, Food preparation, Quality.

Over the period 1956-1968 262 samples of 117 varieties of potato were tested for culinary quality; successful established varieties were used as reference standards. The potatoes were provided by State departments of agriculture who, season by season, selected from current field trials samples of their most important varieties from the point of view of development of good commercial varieties. Data for panel means for color, texture, and flavor scores for mashed boiled potato, and specific gravity and total solids determinations of potato tubers have been summarized and analysed. The panel of judges was specially selected, trained, and maintained over the testing period. Standard statistical designs used for the tasting followed established principles for organoleptic tests. These were concerned with the culinary quality of potatoes and their relation to specific gravity and solids contents of the tubers. There was good general agreement between color, texture, and flavor assessments. The wide range of varieties and variation associated with State, season, and agronomic conditions makes the consolidated results of the tests a valuable means of assessing amd comparing varietal performance and selection. (Author)

6J. Industrial (Occupational) Medicine

PB-224 127/1GA PC$6.75/MF$1.45
Bureau of Labor Statistics, Washington, D.C.
WORK INJURIES AND ACCIDENT CAUSES IN THE CONCRETE BRICK AND BLOCK INDUSTRY.
Final rept.,
T. H. Rockwell, and Donald Nameche. Apr 67, 91p BLS-317
See also report dated Nov 59, PB-224 128.

Descriptors: (*Industrial accidents, Concrete plants), (*Concrete plants, Injuries), Environments, Safety engineering, Accident prevention, Hazards, Statistical data, Accident investigations, Surveys.

The report contains the results of a study of the causes of accidents which resulted in disabling injuries in the concrete brick and block industry during 1951. The number of work injuries and related accident causes by type, size (number of employees), and geographic location of establishments are included. The report also contains information about the number of injuries by nature of injury, part of body injured, source of injury, type of accident, hazardous condition, agency of accident, unsafe act, activity of injured, and occupation of injured.

PB-224 128/9GA PC$4.00/MF$1.45
Bureau of Labor Statistics, Washington, D.C.
WORK INJURIES AND WORK-INJURY RATES IN THE CONCRETE BRICK AND BLOCK INDUSTRY, 1957.
Final rept.,
George R. McCormack. Nov 59, 39p BLS-153
See also report dated Apr 67, PB-224 127.

Descriptors: (*Industrial accidents, Concrete plants), (*Concrete plants, Injuries), Environments, Safety engineering, Accident prevention, Hazards, Statistical data, Accident investigations, Surveys.

The reort contains the results of a study of disabling work injuries which occurred in the concrete brick and block industry during 1957. The study covered establishments primarily engaged in manufacturing concrete building blocks and brick throughout the United States, except Alaska and Hawaii. The report includes injury frequency and severity rates by size and geographic location of establishments. Rate information for selected occupations is also provided. The report also contains information about the number of injuries by nature of injury and part of body injured.

PB-224 531/4GA PC$3.00/MF$1.45
Bureau of Mines, Washington, D.C.
RESPONSE VARIATIONS OF A MICROPHONE WORN ON THE HUMAN BODY.
Report of investigations,
Terry L. Muldoon. Sep 73, 49p BuMines-RI-7810
Master's thesis. Prepared in cooperation with Bureau of Mines, Pittsburgh, Pa. Pittsburgh Technical Support Center.

Descriptors: (*Microphones, Acoustic measurement), (*Noise, Dosimeters), (*Acoustic measurement, Mining engineering), (*Industrial hygiene, Noise), Exposure, Thresholds(Perception), Personnel, Sound transducers, Frequency response, Theses.
Identifiers: Noise pollution.

The Bureau of Mines conducted an investigation to quantify microphone response variations which could result when the microphone is worn on a worker, as with a personal noise dosimeter, and to suggest an optimum placement and orientation of the microphone for noise exposure measurements. Previous studies have shown no significant variations in a diffuse field. This investigation, therefore, was conducted in the free conditions of an anechoic chamber using an anthropometric dummy as a subject, and broad band noise as the acoustic stimulus. This investigation established that, in a free field, the wearer's body does significantly affect microphone response; the response variations are a function of azimuth, and location and orientation of the microphone. Results suggest that locating the microphone on top of the subject's shoulder, oriented parallel to the body axis, should yield data comparable to that obtained using a sound-level meter.

6K. Life Support

AD-768 747/8GA PC$2.75/MF$1.45
Navy Experimental Diving Unit Washington D C
EVALUATION OF DACOR'S R-4, OLYMPIC 400, OLYMPIC 800 OPEN CIRCUIT SCUBA REGULATORS,
T. W. Cetta. 9 Jul 73, 13p Rept no. NEDU-RR-8-73

Descriptors: (*Breathing apparatus, *Diving), Efficiency, Life support, Underwater.
Identifiers: SCUBA apparatus.

Dacor Corporation submitted three open circuit SCUBA regulators, models R-4, Olympic 400 and Olympic 800 for evaluation by the Navy Experimental Diving Unit. The Olympic 400 and Olympic 800 were found acceptable for service use. The R-4 was found unacceptable for service use. (Author)

COM-73-11629/5GA Reprint
National Marine Fisheries Services, Seattle, Wash. Northwest Fisheries Center.
EVALUATION OF THE UNDERSEA HABITATS--TEKTITE II, HYDRO-LAB, AND EDALHAB--FOR SCIENTIFIC SATURATION DIVING PROGRAMS,
W. L. High, I. E. Ellis, W. W. Schroeder, and G. Loverich. 1973, 30p NOAA-73073010
Pub. in Helgolander Wissenschaftliche Meeresuntersuchungen, v24 p16-44 1973.

Descriptors: (*Laboratories, *Underwater environments), (*Underwater life support systems, Evaluation), Diving, Research projects, West Germany.
Identifiers: Tektite 2 habitat, *Underwater habitats, Aquanauts, Hydro Lab habitat, EDALHAB(Engineering Design and Analysis Laboratory Habitat).

The assessment of three undersea habitats--Tektite, Hydro-Lab and Edalhab--is based primarily upon the experience of the authors during a total of 62 man-days under saturation diving conditions while conducting biological research programs. A number of desirable and undesirable features were found in each habitat system; none of the individual systems included all of the desirable features. The paper discusses advantages and disadvantages of various features of the habitats including work and living areas, support equipment and techniques, operations and safety. The authors offer their experiences and suggestions to contribute to improvement of habitats and undersea diving operations. (Author)

N73-30089/9GA PC$25.00/MF$1.45
LTV Aerospace Corp., Dallas, Tex. Vought Systems Div.
STUDY OF SPACE SHUTTLE EVA/IVA SUPPORT REQUIREMENTS. VOLUME 1: TECHNICAL SUMMARY REPORT.
R. J. Copeland, P. W. Wood, Jr., and R. L. Cox. 30 Apr 73, 456p NASA-CR-133991, T-192-RP05
Contract NAS9-12507

Descriptors: *Extravehicular activity, *Life support systems, *Pressure suits, *Space shuttles, Aerospace engineering, Emergencies, Human factors engineering, Payloads.

For abstract, see STAR 1121

N73-30091/5GA PC$14.75/MF$1.45
AiResearch Mfg. Co., Los Angeles, Calif.
SPACE SHUTTLE ENVIRONMENTAL AND THERMAL CONTROL/LIFE SUPPORT SYSTEM STUDY.
Final Report.
J. Rousseau. 14 Mar 73, 255p NASA-CR-134009, REPT-73-9097
Contract NAS9-11592

Descriptors: *Environmental control, *Life support systems, *Space shuttles, *Temperature control, Ground support equipment, Space maintenance, Systems engineering, Test equipment.

For abstract, see STAR 1121

N73-30092/3GA PC$4.50/MF$1.45
Analytical Research Labs., Inc., Monrovia, Calif.
EVALUATION OF SPACECRAFT TOXIC GAS REMOVAL AGENTS.
Final Report.
Dec 72, 49p NASA-CR-134013, REPT-3005-F
Contract NAS9-12360

Descriptors: *Breathing apparatus, *Charcoal, *Chemical elements, *Decomposition, *Manned spacecraft, Adsorption, Chemical analysis, Chemical reactions.

For abstract, see STAR 1121

N73-31006/2GA PC$12.50/MF$1.45
Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn.
ICE PACK HEAT SINK SUBSYSTEM - PHASE 1, VOLUME 1.
G. J. Roebelen, Jr. Jun 73, 210p NASA-CR-114624-VOL-1, SVHSER-6223-VOL-1
Contract NAS2-7011
Seri-2.

Descriptors: *Cooling systems, *Heat sinks, *Heat transfer, *Protective clothing, *Space suits, Human factors engineering, Performance tests, Physiological effects, Product development.

For abstract, see STAR 1122

N73-31016/1GA PC$8.50/MF$1.45
General Electric Co., Philadelphia, Pa.
WATER RECOVERY AND SOLID WASTE PROCESSING FOR AEROSPACE AND DOMESTIC APPLICATIONS. VOLUME 2: APPENDICES.
R. W. Murray. 21 May 73, 127p NASA-CR-134027, DOC-73SD4236-VOL-2
Contract NAS9-12505

Descriptors: *Waste disposal, *Waste utilization, *Water reclamation, *Water treatment, Aerospace engineering, Filtration, Fluid filters, Sewage.

For abstract, see STAR 1122

N73-31017/9GA PC$9.75/MF$1.45
General Electric Co., Philadelphia, Pa. Space Div.
WATER RECOVERY AND SOLID WASTE PROCESSING FOR AEROSPACE AND DOMESTIC APPLICATIONS. VOLUME 1: FINAL REPORT.
R. W. Murray. 21 May 73, 155p NASA-CR-134028, DOC-73SD4236-VOL-1
Contract NAS9-12505

Descriptors: *Systems engineering, *Waste utilization, *Water reclamation, Aerospace environments, Industries, Waste disposal, Water treatment.

For abstract, see STAR 1122

N73-31018/7GA PC$6.75/MF$1.45
MSA Research Corp., Evans City, Pa.
DEVELOPMENT OF SYSTEM DESIGN INFORMATION FOR CARBON DIOXIDE USING AN AMINE TYPE SORBER.
Final Report, 18 Nov. 1969 - 12 Feb. 1971.
R. L. Rankin, F. Roehlich, and F. Vancheri. 15 Jun 71, 91p NASA-CR-111849
Contract NAS1-7263

Descriptors: *Amines, *Carbon dioxide removal, *Sorption, *Styrenes, Air filters, Beds (Process engineering), Manned spacecraft, Systems engineering.

For abstract, see STAR 1122

N73-31913/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
DOMESTIC WASH-WATER RECLAMATION USING AN AEROSPACE-DEVELOPED WATER RECOVERY SUBSYSTEM.
J. B. Hall, Jr.. Sep 73, 26p NASA-TM-X-2896, L-9163

Descriptors: *Aerospace engineering, *Distillation equipment, *Potable water, *Water reclamation, Performance, Technology transfer, Water pollution.

For abstract, see STAR 1122

PATENT-3 497 312/GA Not available NTIS
Department of the Navy Washington D C
ATMOSPHERE REGENERATION METHOD FOR CLOSED ENVIRONMENTAL VEHICLES.
Patent,
Jack D. Zeff, Robert A. Bambenek, and Cyril M. Tomsic. Filed 23 Jan 64, patented 24 Feb 70, 11p
Rept nos. PAT-APPL-339 826,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Life support), (*Air, *Regeneration), (*Life support, Air), Confined environments, Hydrogen, Methane, Carbon dioxide, Carbon monoxide, Hydrocarbons, Phosphates, Sulfites, Catalysis, Exhaust gases.
Identifiers: PAT-CL-23-4, Hydrogen sulfide, Oxygen supply equipment.

The patent describes a method of regenerating a spent atmosphere containing one or more of hydrogen, methane, sulfites, phosphites, carbon monoxide, hydrogen sulfide and heavy hydrocarbons as contaminants. It conprises of subjecting the spent atmsophere to catalytic oxidation to convert hydrogen to water, carbon monoxide to carbon dioxide and methane and other hydrocarbons to carbon dioxide and water; passing the oxidized gas through activated carbon whereby sulfites, sulfides and phosphites are absorbed; passing the resulting gas containing carbon dioxide into contact with a bed of silver oxide to remove the carbon dioxide; desorbing the carbon dioxide and reducing it with carbon by catalytic reduction with hydrogen. This is of interest in submarines, in mines, or in manned space ships.

6L. Medical and Hospital Equipment

AD-768 946/6GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
METHODISCHE UNTERSUCHUNGEN UEBER DIE BESTIMMUNG DES DURCHMESSERS UND DER REISSKRAFT VON RESORBIERBAREM CHIRURGISCHEM NAHTMATERIAL (METHODICAL STUDY ON THE DETERMINATION OF DIAMETER AND TEARING RESISTANCE OF RESORBABLE SURGICAL SUTURE).
G. Spicher. 1969, 31p
Text in German; summary in English.
Availability: Pub. in Arzneimittel-Forschung (West Germany), v19 p228-237 1969.

Descriptors: (*Ligatures, Performance(Engineering)), (*Plasticity, Ligatures), Surgical supplies, Tests, Surgery, West Germany.
Identifiers: *Sutures, Catgut.

One hundred thirteen rolls of catgut from the current production of nine German manufacturers were subjected to comparative studies on how much diameter and tearing resistance of resorbable surgical suture depend on the method of measuring and on the degree of steeping. The study was initiated by the arguments presented against the suggested test directions for DAB 7. (Modified author abstract)

ARCO-3057-12/GA PC$5.45/MF$1.45
Arco Nuclear CO., Leechburg, PA.
RADIOISOTOPE POWERED CARDIAC PACEMAKER PROGRAM. QUARTERLY PROGRESS REPORT, FEBRUARY 1, 1973--APRIL 30, 1973.
Aug 73, 22p
Contract AT(11-1)-3057

Descriptors: (*Cardiac pacemakers, *Research programs), Design, Fabrication, Radioisotopes, Safety, Testing.

For abstract, see NSA 28 07, number 15418.

PATENT-3 750 479/GA Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
TILTING TABLE FOR ERGOMETER AND FOR OTHER BIOMEDICAL DEVICES.
Patent.
R. L. Gause, and R. A. Spier. Patented 7 Aug 73, 8p NASA-CASE-MFS-21010-1,
Misc-Filed 8 May 1972 Supersedes N72-25127 (10 - 16, p 2114).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Ergometers, *Exercise (Physiology), *Human body, *Medical equipment, Biomedical data, Patents.

The apparatus is for testing the human body in a variety of positions, ranging from the vertical to the supine, while exercising on an ergometer; and can also be used for angular positioning of other biomedical devices. It includes a floor plate and a hinged plate upon which to fix the ergometer, a back rest and a head rest attached at right angles to said hinged plate and behind the seat of the ergometer, dual hydraulic cylinders for raising and lowering the hinged plate through 90 deg by means of a self contained hydraulic system, with valve means for control and positive stops on the apparatus to prevent over travel. Tests can be made with the subject positioned on the seat of the ergometer, through the various angles, with a substantially normal body attitude relative to the seat and ergometer.

PB-224 083/6GA PC$3.75/MF$1.45
Battelle Columbus Labs., Ohio.
FEASIBILITY OF MICROENCAPSULATED DETOXICANTS FOR REMOVAL OF NITROGENOUS METABOLITES VIA ORAL INGESTION AND CHARACTERIZATION OF AZOTEMIC DOG GUT FLUID.
Annual rept. 1 Nov 72-31 Jan 73,
David L. Gardner, Donald C. Emmerling, Craig R. Hassler, Byung C. Kim, and William C. Baytos. 30 Jan 73, 77p AK-3-68-622
Contract PH-43-68-622
See also PB-206 503.

Descriptors: (*Artificial kidneys, *Adsorbents), (*Uremia, Therapy), (*Detoxification, Uremia), Urease, Urea, Uric acid, Protein metabolism, Intestines, Experimental data, Dogs, Ingestion(Biology).
Identifiers: *Microcapsule systems, Hemodialysis, *Azotemia, Urease microcapsules.

An azotemic dog model has been used for characterization of azotemic gut fluid. Triple lumen perfusion studies have permitted us to obtain the rate of net water movement in various intestinal segments as well as obtaining flux rates of urea, creatinine, and uric acid into these segments. Preliminary results indicate large amounts of urea enter the dogs small intestinal tract. Lesser but probably significant amounts of creatinine and uric acid enter the tract so that adsorbents could

serve as an adjunct to hemodialysis. Azotemic dogs containing duodenal and jejunal catheters have been fed stabilized urease microcapsules as well as combination microcapsule (stabilized urease plus zirconium phosphate). Capsules recovered from these gut regions indicate the enzyme is definitely functional.

PB-224 569/4GA PC$4.25/MF$1.45
Stanford Research Inst., Menlo Park, Calif.
ENERGY TRANSMISSION THROUGH INTACT SKIN.
Annual rept. Jan 71-Jun 72,
P. M. Newgard, J. R. Woodbury, and R. L. Kiang.
Feb 73, 104p* NIH/NHLI-67-1422-4
Contract PH-43-67-1422

Descriptors: (*Mechanical hearts, Energy transfer), (*Energy transfer, *Skin), (*Electromechanical transducers, Mechanical hearts), Energy, Mechanical organs, Heart rate, Control, Computers, Implantation.
Identifiers: *Cardiac assist devices.

The development of a face-cam-actuated electromechanical energy converter is described. Design and construction improvements during the first 500 hours of service are discussed. The redesign of a heart rate control computer and motor drive circuits for improved system efficiency resulted in a total power requirement of about 20W into the intact-skin transformer. Four complete power and control systems--suitable for short term in-vivo testing are described and in-vivo test results are presented. Design recommendations are provided to indicate the method by which subsequent designs can achieve improved durability, efficiency, and reduced size and weight.

PB-224 697/3GA PC$7.00/MF$1.45
National Inst. of Arthritis and Metabolic Disease, Bethesda, Md.
ANNUAL CONTRACTORS' CONFERENCE OF THE ARTIFICIAL KIDNEY PROGRAM OF THE NATIONAL INSTITUTE OF ARTHRITIS, METABOLISM, AND DIGESTIVE DISEASES PROCEEDINGS (6TH) HELD IN BETHESDA, MD. ON FEBRUARY 12-14, 1973.
Conference proceedings,
Keatha K. Krueger. 1973, 305p* AK-6-73248
DHEW-Pub-74-248
See also report dated 1972, PB-224 696.

Descriptors: (*Artificial kidneys, Meetings), Research, Uremia, Urologic diseases, Metabolism, Physiology, Nutrition, Clinical medicine, Neurology, Psychological effects, Membranes, Dialyzers.
Identifiers: *Hemodialysis, Chronic diseases, Biomaterials.

Proceedings are reported of the annual contractors' conference of the artificial kidney-chronic uremia program. Included are abstracts of work being performed by each of the current contractors, as well as summations and discussions.

PB-224 725/2GA PC$3.50/MF$1.45
Battelle-Pacific Northwest Labs., Richland, Wash.
DEVELOPMENT AND EVALUATION OF ARTIFICIAL DENTAL ANCHORS OF NON-NATURAL DESIGN IMPLANTED IN MINIATURE SWINE.
Annual rept. 30 Jun 72-29 Jun 73,
R. P. Marshall, M. T. Karaginnes, J. J. Rasmussen, and R. E. Westerman. Jul 73, 71p* NIDR-NIH-71-2386-1-73
Contract PHS-71-2386
See also PB-212 695.

Descriptors: (*Dental prostheses, Implantation), Dental materials, Ceramics, Titanium alloys, Fabrication, Evaluation, Swine, Bioassay, Aluminum containing alloys, Vanadium containing alloys.
Identifiers: Biocompatible materials, Titanium alloy 6Al 4V.

Two porous materials, one ceramic and one metal, have been fabricated into cylindrical dental anchors and implanted into the mandibles of miniature swine. The ceramic alumina porcelain was formed by special slipcasting and firing techniques. The metal anchors, all Ti-6Al-4V alloy, have been fabricated from Battelle-developed void metal composite. Transgingival posts were attached to all dental anchors allowing some intraoral stressing of the prostheses as well as an opportunity to examine the metallic/gingival interface. Dental anchors were evaluated by clinical observation, histologic examination, and mechanical testing.

PB-224 751/8GA PC$4.50/MF$1.45
Thermo Electron Corp., Waltham, Mass.
DEVELOPMENT OF A LEFT VENTRICLE-TO-AORTA ASSIST DEVICE.
Annual rept. Jun 71-Jun 72,
W. F. Bernhard, C. G. LaFarge, and Walter J. Bornhorst. Oct 72, 135p* TE4081-40-73 PH-43-67-1116-5
Contract PH-43-67-1116
See also PB-222 870

Descriptors: (*Mechanical hearts, *Cardiac ventricles), (*Aorta, Mechanical hearts), Implantation, Valves, Pumps, Cardiovasculas system, Physiology, Blood circulation, Blood pressure, In vivo analysis, Cattle, Evaluation, Experimental data.
Identifiers: *Cardiac assist devices.

A left ventricular assist device (LVAD) has been developed and evaluation has been made of the short and long-term physiological effects of the device. The LVAD is a double-valve pump interposed between the left ventricular apex and the descending aorta. It is capable of reducing left ventricular peak pressure and stroke work to low levels, thereby minimizing myocardial energy consumption. This report describes the work directed toward evaluation of pump function in chronic calf experiments extending for periods up to six months. Studies have been carried out in normal calves and in calves with induced left ventricular failure produced by injection of plastic microspheres (9.0--14.0 microns in diameter) into the left coronary artery. Serial cardiac catheterizations and angiography have permitted investigation of pump performance in the heart failure state over periods up to two months, with tissue perfusion mainly dependent upon the function of the left ventricular assist device. Hematologic studies over many weeks have failed to indicate development of anemia or other evidence of chronic blood damage.

6M. Microbiology

AD-768 481/4GA Reprint
California Univ Berkeley Naval Biomedical Research Lab
'NEISSERIA' SPECIES ISOLATED FROM DOLPHINS,
Neylan A. Vedros, D. G. Johnston, and Phyllis I. Warren. 22 Jan 73, 4p
Sponsored in part by Office of Naval Research.
Availability: Pub. in Jnl. of Wildlife Diseases, v9 p241-244 Jul 73,

Descriptors: (*Neisseria, *Cetacea), Microorganisms, Mammals, Aquatic animals, Bacteria, Mice, Serodiagnosis.
Identifiers: Neisseria mucosa, Lagenorhynchus obliguidens, Delphinus bairdi, Marine mammals.

Neisseria species have been identified as part of the normal microbial flora of several domestic and experimental animals, but they have not however, been observed in marine mammals. We are presently being studied is the total microbial profile (bacteria, viruses, and fungi) of marine mammals in their natural habitat and the inter- and intra-species changes which occur when the animals are brought into contact with man, other animals, and when placed in isolation under husbandry conditions. The report describes the isolation of a bacterium Neisseria mucosa from dolphins (Lagenorhynchus obliguidens and Delphinus bairdi). The importance of this observation with regard to the husbandry of marine mammals is discussed.

AD-768 502/7GA PC$3.00/MF$1.45
Army Medical Research Inst of Infectious Diseases Frederick Md
COMBINED USE OF INTERFERON AND CERTAIN STYRYLQUINOLINES IN CELL CULTURING AND IN EXPERIMENTAL ARBOVIRUS INFECTION INFECTION,
N. A. Leonteva, A. N. Fomina, Z. V. Idrisova, A. K. Shubladze, and G. A. Galegov. 1973, 6p
Trans. of Voprosy Virusologii (USSR) p482-485, 17 Apr 72.

Descriptors: (*Arboviruses, *Biological products), (*Quinolines, Arboviruses), Virus diseases, Arboviruses, Venezuelan equine encephalomyelitis virus, Western equine encephalomyelitis virus, Tissue culture cells, Inhibition, Mice, Experimental data.
Identifiers: Translations, *Interferons, *Antiviral agents.

The effect of the combined use of interferon and certain preparations of the styrylquinoline group on the reproduction of the viruses of Venezuelan equine encephalomyelitis (VEE) and Western equine encephalomyelitis (WEE) was studied. The preparations R-29P, R-42P and R-43P in combination with interferon in chicken embryo fibroblast cultures showed antiviral activity in a reduction of VEE and WEE virus titers by 6.6 and 7.5 log, respectively. Preliminary treatment of white mice with WEE virus, followed by two injections of R-42, led to increased protective antiviral activity and to prevention of development of the disease in 60-75% of the test animals, depending on the infectious dose. (Author)

AD-768 503/5GA PC$3.00/MF$1.45
Army Medical Research Inst of Infectious Diseases Frederick Md
CHARACTERISTICS OF VIRION RNA OF VENEZUELAN EQUINE ENCEPHALOMYELITIS VIRUS,
A. S. Agabalyan, L. V. Uryvaev, and F. I. Ershov. 1973, 7p
Trans. of Voprosy Virusologii (USSR) p490-494, 17 Apr 72.

Descriptors: (*Venezuelan equine encephalomyelitis virus, *Ribonucleic acids), Group A arboviruses, Arboviruses, Physical properties, Chemical analysis, Molecular properties, USSR.
Identifiers: Translations.

Certain physico-chemical parameters of infectious RNA of the Venezuelan equine encephalomyelitis virus were determined. It was established that virion RNA sediments in sucrose gradient with sedimentation coefficient of 38-40 S. In fractionation of RNA in cesium sulfate density gradient, the RNA was found in one zone of 1.66 g/cc density. Electrophoresis of virion 40 S RNA in 3.5% agarose-polyacrylamid gel supplied additional information on RNA preparations, making it possible to determine the molecular weight of RNA, which, in several different experiments, varied within the limits of 4,000,000 and 4,300,000 daltons. (Author)

AD-768 723/9GA PC$2.75/MF$1.45
Institute of Microbial Chemistry Tokyo (Japan)
GENETIC AND BIOCHEMICAL STUDIES OF DRUG RESISTANCE IN PATHOGENIC BACTERIA.
Rept. no. 2 (Annual), 15 Jun 72-14 Jun 73,
Susumu Mitsuhashi. 17 Sep 73, 20p ARDG(FE)-485-2
Grant DA-RDRF-S92-544-72-G187

Descriptors: (*Bacteria, *Drugs), (*Chemotherapeutic agents, Bacteria), Resistance(Biological), Pathology, Genetics, Biochemistry, Antibiotics, Staphylococcus aureus, Escherichia coli, Pseudomonas, Proteus, Klebsiella, Shigella, Japan.
Identifiers: *Drug tolerance, *Antiinfectives and antibacterials.

Collected ions have been made of many bacterial strains from patients at hospitals which are geographically dispersed in Japan, including Shigella, other gram-negative bacteria and staphylococci. The biological and biochemical properties are studied according to the usual bacterial technics. Resistance to about 30 antibacterial agents was assayed, and biochemical and genetic studies of bacterial drug-resistance were conducted. This report discusses the genetic and biochemical problems of drug-resistance in bacteria.

AD-768 735/3GA PC$2.75/MF$1.45
Institute of Microbial Chemistry Tokyo (Japan)
MICROBIAL DRUG RESISTANCE (EPIDEMIOLOGY, GENETICS).
Rept. no. 5 (Final) 26 Mar 70-31 May 72,
Susumu Mitsuhashi. 20 Sep 73, 20p ARDG(FE)-355-5
Grant DA-CRD-afe-s92-544-68-g152

Descriptors: (*Bacteria, Drugs), (*Drugs, Resistance(Biological)), Antibiotics, Enzymes, Pseudomonas aeroginosa, Escherichia coli, Nucleosides, Attenuation, Genetics, Biochemistry, Japan.
Identifiers: *Drug tolerance, Antiinfectives and antibacterials, Glycosides.

Antibacterial activity of aminoglycosides toward Pseudomonas aeruginosa was investigated by using 221 clinical isolates. One hundred and seventy-five strains were shown to be highly resistant against one or more of the antibiotics tested. A lividomycin-phosphorylating enzyme from a lividomycin-resistant strain of Escherichia coli carrying an R factor was partially purified by fractionation with ammonium sulfate and Sephadex G-100 column chromatography. The enzyme inactivated, several antibiotics having a D-ribose moiety linked to 2-deoxystreptamine, i.e., lividomycin A and B, neomycin, paromomycin, and vistamycin, but did not inactivate the kanamycins, streptomycin, or the gentamicin C components. The gentamicin acetylating enzyme from a resistant strain of Pseudomonas aeruginosa was purified by ammonium sulfate fractionation and column chromatography. The enzyme inactivated gentamicin C1, C2, and C1a in the presence of acetylcoenzyme A but did not inactivate other aminoglycosidic antibiotics such as paromomycin, mannosylparomomycin, dihydrostreptomycin, neomycin, kanamycins. The dihydrostreptomycin was inactivated by adenylylation of the drug in the prescence of both ATP and Mg(2+) by carrying an intermediate SM-resistant strains of S.aureus. (Modified author abstract)

AD-768 809/6GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
UEBER DIE WIRKUNG VON NYSTATIN GEGEN CANDIDA ALBICANS IM PROTEOLYSE-KULURFILTRAT VON CANDIDA ALBICANS (ABOUT THE EFFECT OF NYSTATIN ON CANDIDA ALBICANS IN THE PROTEOLYSIS-CULTUREFILTRATE OF C. ALBICANS),
F. Staib, and G. Gruehn. 2 Jul 71, 5p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-218 p369-373 1971.

Descriptors: (*Candida, *Fungicides), Culture media, Growth, Peptide hydrolases, Fungi, West Germany.
Identifiers: Candida albicans, *Nystatin.

The effect of nystatin against 30 strains of C. albicans has been tested in SABOURAUD's glucose broth as well as in the proteolysis-culturefiltrate of C. albicans, strain CBS 2730. Nystatin caused a stronger inhibition in proteolysis-culturefiltrate, having an initial pH of 6,0 than in SABOURAUD's glucose broth. The minimum inhibitory concentration of nystatin in proteolysis-culturefiltrate (initial pH 3,5) was 100 units/ml for 15 strains and exceeding 100 units/ml for 5 strains. In SABOURAUD's glucose broth having the same initial pH, on the other hand, the minimum inhibitory concentration of nystatin was 25 units/ml for 17 strains and 12,5 units/ml for 12 strains. These results are of interest because optimal proteolysis by C. albicans in vitro occurs at a pH of approx. 3,5.

AD-768 810/4GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
BAKTERIOLOGISCH-SEROLOGISCHE UNTERSUCHUNGEN AN EXPERIMENTELL MIT S. TYPHIL INFIZIERTEN MEERSCHWEINCHEN (TYPHUSBAKTERIENAUSSCHEIDER) (BACTERIOLOGICAL AND SERIOLOGICAL INVESTIGATIONS ON GUINEA PIGS, EXPERIMENTALLY INFECTED WITH S. TYPHI (BACTERIAL EXCRETORS),
Ilse Wolfe, and Georg Henneberg. 12 Oct 68, 9p
Text in German; attached summary in English.
Availability: Pub. in Zen tralblatt fuer Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene. I. Originale (West Germany) v209-S p186-195 1969.

Descriptors: (*Salmonella, *Microbiology), (*Serodiagnosis, Salmonella), West Germany, Bacteria, Infections, Guinea pigs, Experimental data.
Identifiers: Salmonella typhimurium.

Investigations were carried out on 151 guinea pigs previously infected with Salmonella typhi through the gallbladder. The animals were examined for their excreting of Salmonella typhi as well as for their agglutination titers. Depending on the duration of the observation period excretion of Salmonella typhi was demonstrated in the individual groups as long as 103, 114, 208, 302, 315, and 351 days following infection. In a great number of animals the Widal reaction remained positive till the end of the experimental period, which means as long as 100, 114, 208, 302, 315 and 351 days after infection. From these observations follows that the above described method of testing represents a suitable model for experiments on the sanitation of typhoid carriers. The experiments, it is true, were completed quite a long time ago, however, still may be of some interest for chemotherapists, since so far the problem has remained unsolved. In the present case all sanitation trials performed on the animals with chloromycetin, even after equal treatment with omnadin, ended in failure. (Author)

AD-768 813/8GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
COMBINED VACCINES FROM INACTIVATED ENTEROBACTERIACEAE FOR ORAL APPLICATION,
H. Raettig. 1971, 8p
Availability: Pub. in International Symposium on Enterobacterial Vaccines, v15 p49-56 1971.

Descriptors: (*Enterobacteriaceae, *Vaccines), (*Infectious diseases, Intestines), Bacteria, Experimental data, Epidemiology, Immunity, Ingestion(Physiology), West Germany.

Combined oral vaccines from inactivated Enterobacteriaceae yielded in animal experiments strikingly good protection to parenteral infection. The non-specific elements of such vaccines obviously are acting synergistically with the specific elements of the vaccine. The mechanism of this phenomenon has still remained unelucidated.

AD-768 814/6GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
VERGLEICHENDE ELKTRONENMIKROSKOPISCHE UNTERSUCHUNGEN AN RHABDOVIREN PFLANZLICHER UND TIERISCHER HERKUNFT. I. ERSTE ELEKTRONENMIKROSKOPISCHE ERGEBNISSE MIT DEM PFLANZLICHEN MODELL SOWTHISTLE YELLOW VEIN VIRUS (SYVV) UND SEINEM VECTOR HYPEROMYZUS LACTUCAE (L) (COMPARATIVE ELECTRONMICROSCOPICAL INVESTIGATIONS ON RHABDOVIRUSES OF ANIMAL ORIGIN. I),
Mushin Oezel. 18 Mar 71, 17p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-217 p160-175 1971.

Descriptors: (*Arboviruses, *Electron microscopy), (*Lice, Arboviruses), Disease vectors, Parasites, Viruses, West Germany.
Identifiers: Hyperomyzus lactucae, *Rhabdoviruses, Sowthistle yellow vein virus.

Electronmicroscopical investigations on SYVV in its transmitting agent Hyp. lactucae yielded the following results: In the main and cover cells of the salivary gland of infected lice (Hyp. lactucae virus was observed in the cytoplasm, nucleus, nucleoli, as well as in the prosecretory granula. During investigations of gastrical and intestinal cells as well as of embryons in their early phase of development, virus was also seen in the cytoplasm and cell nucleus. The neighboring fatty cells of the intestine and fatty cells in the embryons did also contain virus. (Author)

AD-768 816/1GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
VERGLEICHENDE UNTERSUCHUNGEN AN ZYSTENBILDENDEN TOXOPLASMA-STAEMMEN. II. MITTEILUNG: ZYSTENENTWICKLUNG UND HUMORALE ANTIKOERPERBILDUNG (COMPARATIVE INVESTIGATIONS ON CYST-FORMING TOXOPLASMA STRAINS. II. COMMUNICATION: DEVELOPMENT OF CYSTS AND FORMATION OF HUMORAL ANTIBODIES),
H. Werner, and H. Pichl. 10 Mar 69, 17p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene. I. Originale (West Germany) v210-S p402-416 1969.

Descriptors: (*Toxoplasma, *Antigens + antibodies), Protozoa, Parasites, Histology, Morphology(Biology), Serodiagnosis, West Germany.
Identifiers: Cysts, Toxoplasma gondii, Host parasite relations.

In order to elucidate further development of T. gondii in the mammalian organism, it has been investigated which role humoral antibodies play in formation and multiplication of Toxoplasma cysts and whether there exists any relationship between the quantity of antigen (number of cysts) and the level of antibody titers. The details referring to the development of the parasite in the host organism have been elaborated by morphological, histological and serological investigations on 5000 mice which had been infected with different cyst-forming Toxoplasma strains. (Author)

AD-768 818/7GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
BEITRAG ZUE POLIOMYELITIS-IMMUNITAAT IN DER BUNDESREPUBLIK DEUTSCHLAND 1969 (CONTRIBUTION TO POLIOMYELITIS IMMUNITY IN THE FEDERAL REPUBLIC GERMANY IN 1969),
L. Gruetzner, H. Pichl, I. Lehmann, and H. Lenz. 13 Nov 70, 18p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-217 p284-299 1970.

Descriptors: (*Poliomyelitis virus, Immunity), (*West Germany, Diseases), Antigens + antibodies, Public health, Adults, Infants, Placenta, Males, Females, Aging(Physiology), West Germany.

Following former observations on the surveillance of poliomyelitis antibody presence made 1966/67, 1909 sera from 352 military personnel, 325 pregnant women, and 117 mothers and their neonates were examined for the presence of neutralizing antibodies. The number of adults with a complete set of antibodies has shown a constant increased character up to 80-90% in 1969. In the same way, there has been a significant increase in the number of persons with demonstrable type II poliovirus antibodies. A significant difference in the distribution of antibodies between primiparae and multiparae could not be established. The rates of increase in male and female persons of the same age, having a complete set of antibodies amounted to 21 and 34% respectively. (Author)

AD-768 819/5GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
ZUR MORPHOGENESE DER ZELLWAND VON STAPHYLOKOKKEN. I. QUERWANDBILDUNG UND ZELLTRENNUNG (CONTRIBUTION TO THE MORPHOGENESIS OF THE CELL WALL OF STAPHYLOCOCCI. I. THE FORMATION OF THE CROSS WALL AND THE CELL SEPARATION),
Peter Giesbrecht, and Joerg Wecke. 20 Jul 71, 20p
Text in German; summary in English. Proceedings of International Congress for Microbiology (10th), Mexico, 1970.
Availability: Pub. in Cytobiologie, v4 n2 p349-368 1971.

Descriptors: (*Staphylococcus, *Cell wall), Cytology, Cell structure, Mitosis, Bacteria, West Germany.

The formation of the cross wall and the separation of the two daughter cells of Staphylococcus aureus have been studied. After an asymmetrical initiation of the cross wall formation under the primary cell wall, an annular torus is developing. From this torus under the primary cell wall, by centripetal surface growth, the cross wall is continued in the way of a closing iris diaphragm. By this a concentric tubular system is built-in continually into the cross wall which is involved in the cell separation. Then, by apposition growth, a continual thickening of the cross wall follows its surface growth. Further important functions during the cell separation have a peripheric annular canal within the cross wall which is not activated before the cross wall is completed and a periodically arranged pore system within the primary cell wall. All these structures, so far unknown in bacteria, are developing during the different stages of cell separation. Their function during cross wall formation is discussed in detail. As to the particular stages of the cell separation and the autolysins herein involved, detailed conceptions are proposed. (Author)

AD-768 820/3GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
NACHWEIS VON HAEMAGGLUTINATIONSHEMMENDEN ANIKOERPERN GEGEN DAS ROETELNVIRUS IN BERLIN-WEST (DETERMINATION OF RUBELLA HEMAGGLUTINATION INHIBITING ANTIBODY BERLIN-WEST),
G. Antonaidis, I. Koutsouleris, and H. Timm. 28 Jul 70, 5p
Text in German; attached abstract in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) v216 p286-289 1971.

Descriptors: (*Rubella, *Agglutinins), (*Antigens + antibodies, Rubella), Measles viruses, Tests, Humans, Serodiagnosis, West Germany.
Identifiers: Hemagglutination.

The technique of the hemagglutination inhibition test as used in the Robert Koch-Institute for the demonstration of rubella antibody is described. This technique enables the examination of a great number of sera within a short time while having a minor expenditure of material. The method was used to examine for rubella antibody 756 sera from test persons of both sexes and various age groups. In neonates and infants up to the 30th day of life, diaplacentally transmitted antibody could be demonstrated in 94% of cases. In the course of the first year of life, the rate of positive sera will fall to 11% and rise again, gradually, for the age groups that follow. For age 20 and over, rubella antibodies are demonstrable in 92-97% of the sera examined.

AD-768 821/1GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
ENTWICHLUNSPHASEN, ENTWICKLUNGSZYKLEN UND SYSTEMATISCHE STELLUNG VON TOXOPLASMA GONDII (DEVELOPMENTAL CYCLES, DEVELOPMENT PHASES AND SYSTEMATIC POSITION OF TOXOPLASMA GONDII),
H. Werner, and K. Janitschke. 2 Apr 70, 12p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) v214 p540-550 1970.

Descriptors: (*Toxoplasma, *Life cycle), (*Parasites, Life cycle), Parasitic diseases, Cats, Intestines, West Germany.
Identifiers: *Toxoplasma gondii.

The different forms of Toxoplasma gondii shown in the paper of Werner and Voss were assigned in the present paper to the specific developmental phases of the parasite. There are five developmental phases: Proliferative multiplication phase; cyst phase; agamogony (Schizogony); gamogony; sporogony. These five phases together form the fundamental cycle. The observed variability within this cycle is stressed. The phases of unsexual development prefer the tissue of the reticuloendothelial system. the cyst phase the skeletal muscles and the Central Nervous System (CNS), and the phases of sexual development the epithelium of the small intestine. The time intervals after infection when the individual developmental phases of toxoplasms may be observed in the tissue were shown to depend upon the parasitic phase used for infection and upon the path of infection. Demonstration of the complete sexual developmental course up to the formation of mature, infective oocysts was successful so far only in the domestic cat.

AD-768 822/9GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
ZUR DIFFERENTIAL-DIAGNOSE VON PARASITEN 'ZYSTEN' IN HERZMUSKELFASERN (DIFFERENTIAL DIAGNOSIS OF PARASITIC 'CYSTS' IN MYOCARDIAL FIBRES),
K. Salfelder, H. Werner, A. Leon, and T. R. deLiscano. 1969, 11p
Prepared in cooperation with Universidad de Los Andes, Merida (Venezuela). Instituto de Anatomia Patologica and Universidad de Los Andes, Valeva (Venezuela). Dept. of Patolgica Anatomia. Text in German; summary in English.
Availability: Pub. in Tropenmedizin und Parasitologie, v20 n1 p50-59 Mar 69.

Descriptors: (*Parasites, *Heart), Morphology(Biology), Sporozoa, Protozoa, Zoomastigina, Toxoplasma, Pathology, Histology, West Germany, Venezuela.
Identifiers: Sarcosporidia, Trypanosoma cruzi, Toxoplasma gondii, Cysts.

A description of the main morphological features permitting the differentiation between Sarcosporidia, Trypanosoma cruzi (leishman bodies) and Toxoplasma gondii in myocardial fibres is given: The cysts of Sarcosporidia contain spores of bolong and sometimes crescent shape, which are arranged in distinct compartments. The leishman bodies of T. cruzi found in 'pseudocysts' vary in size and shape depending on their stage of development; they are characterized by the rod-like kinetoplast, which may not be clearly discernible in tissue sections stained with hematoxylin. The cysts of T. gondii may be either round or oblong in shape and vary in size. Their membranes are formed by the parasites, and may exhibit protrusions. The parasites are small and of rather uniform round shape, their nuclei staining distinctly with hematoxylin. In the proliferating stage, the nests of T. gondii vary in size and shape, too, but the single parasites are clearly separated from each other. The parasitic manifestations listed may or may not be attented by myocarditis. In areas where Chagas' disease is endemic, the possibility of a Toxoplasma infection should be considered. (Modified author abstract)

AD-768 823/7GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
ELEKTRONENMIKROSKOPISCHER NACHWEIS 'VIRUSARTIGER' PARTIKEL IN BLUTPLASMAKONSERVEN MIT HEPATITIS ASSOCIATED ANTIGEN (HAA) (ELECTRON MICROSCOPICAL DEMONSTRATION OF 'VIRUS-LIKE' PARTICLES IN BLOOD PLASMA UNITS TOGETHER WITH HEPATITIS ASSOCIATED ANTIGEN (HAA)),
J. Arodaca, W. Lange, and H. Koehler. 31 Mar 71, 11p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-217 p554-562 1971.

Descriptors: (*Hepatitis viruses, *Blood plasma), (*Blood transfusions, Hepatitis viruses), Antigens + antibodies, Electron microscopy, Viruses, Serodiagnosis, West Germany.

Seven samples of blood plasma have been tested by electron microscopy. All of them were serologically HAA-positive. They originated from blood donors who externally appeared healthy. Two of the plasma samples originated from donors, whose previous donations were suspect of having caused transfusion hepatitis. In accordance with the serological findings (immunodiffusion and counter-immunoelectro-osmophoresis) HAA particles could be demonstrated in all blood plasma units by means of the electron microscope. In all cases spherical particles of about 20 nm, in four cases additionally tubular forms of the same diameter, were seen. (Modified author abstract)

AD-768 825/2GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
EXPERIMENTELLE UNTERSUCHUNGEN UEBER DAS VORKOMMEN VON TOXOPLASMEN IM VERDAUUNGSTRAKT VON HAUSKATZEN (EXPERIMENTAL INVESTIGATIONS ON THE OCCURRENCE OF TOXOPLASMA IN THE INTESTINAL TRACT OF CATS),
K. Janitschke. 10 May 71, 9p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-218 p517-524 1971.

Descriptors: (*Toxoplasma, *Cats), (*Intestines, *Parasitic diseases), Infectious diseases, Excretion, Physiology, Tests, Protozoa, West Germany.

The multiplication of toxoplasms in orally infected cats takes place into two different ways. In the first, the agent is excreted as oocyst in the faeces after non-sexual and sexual division in the intestinal epithelium. In the second one, it undergoes non-sexual multiplication and penetrates through the various layers of the small intestine, into other organs of the body. The spreading in terms of time and site taking place has been the subject of the studies described. (Modified author abstract)

AD-768 830/2GA PC$3.00/MF$1.45
Army Medical Research Inst of Infectious Diseases Frederick Md
SYNTHESIS OF VIRUS-SPECIFIC PROTEINS ON HETEROLOGOUS AND HOMOLOGOUS RIBOSOMES,
V. M. Zhdanov, T. I. Tikhonenko, and B. S. Naroditskii. 1973, 13p
Trans. of Biokhimiya (USSR) v37 n4 p675-681 1972.

Descriptors: (*Proteins, Biosynthesis), (*Viruses, Proteins), Ribosomes, Ribonucleic acids, Nucleic acids, USSR.
Identifiers: Translations.

The synthesis of virus-specific proteins in a cell-free system containing homologous (chick embryo) and heterologous (Escherichia coli) ribosomes was comparatively studied in the presence of RNA from Sendai virus, Newcastle disease virus and Venezuelan equine encephalitis virus. In both systems synthesis of proteins having similar electrophoretic mobility took place in the presence of virus templates. Moreover, based on the reaction of the corresponding virus-specific sera, virus proteins which are fully competent immunologically are synthesized. (Author)

AD-768 831/0GA PC$3.00/MF$1.45
Army Medical Research Inst of Infectious Diseases Frederick Md
A STUDY OF THE COMPLEXING OF VIRAL RNA WITH CELL PROTEINS,
L. B. Uryvaev, T. M. Sokolova, F. I. Ershov, and V. M. Zhdanov. 15 Apr 72, 14p
Trans. of Voprosy Virusologii (USSR) v17 n6 p670-676 1972.

Descriptors: (*Ribonucleic acids, *Arboviruses), (*Proteins, Ribonucleic acids), Cells(Biology), Embryonated egg technique, In vitro analysis, Tests, Tables, Experimental data, Venezuelan equine encephalomyelitis virus, USSR.
Identifiers: Translations.

Information of some physico-chemical properties of chick fibroblast proteins forming in vitro complexes with Venezuelan equine encephalomyelitis virus RNA has been obtained. Soluble cell proteins which are not sedimented by centrifugation at 105,000g have been shown to form complexes with viral RNA. These proteins adsorb solidly on DEAE-cellulose at pH 6.8 and are eluted from it only with 0.3 M NaCl. The sedimentation analysis revealed three classes of proteins according to the sedimentation constant which form complexes with RNA. It has been demonstrated that the process of complexing of viral RNA with cell proteins occurs most effectively in solutions of low and moderate ion strength. The fact that RNA complexing with protein is inhibited by high concentrations of salt suggests participation in it of electrostatic forces. The relationship between the sedimentation rate of the resulting ribonucleoprotein complexes and the amount of protein complexing with RNA has been established. (Author)

AD-768 832/8GA PC$3.00/MF$1.45
Army Medical Research Inst of Infectious Diseases Frederick Md
LOW-TEMPERATURE THRESHOLDS OF REPRODUCTION OF SOME GROUP A ARBOVIRUSES IN TISSUE CULTURE,
D. K. Lvov, D. S. Cheban, and Ya. Ya. Tsilinskii. 1973, 9p
Trans. of Voprosy Virusologii (USSR) v17 n3 p283-287 1972.

Descriptors: (*Arboviruses, Low-temperature research), Culicidae, Reproduction(Physiology), Viruses, Embryonated egg technique, Tissue culture, Group A arboviruses, USSR.
Identifiers: Translations.

The research determines the lower reproduction thresholds of Group A Arboviruses in tissue culture prepared from chicken embryo fibroblasts. Also studied is the effect of superthreshold temperatures on the yield of these viruses. For viruses whose area includes part of the temperate zone, the lower temperature threshold of reproduction is lower than for viruses distributed in the equatorial, subequatorial and tropical zones. By raising the incubation temperature by 1 degree, the yield of viruses was increased. (Modified author abstract)

AD-768 867/4GA PC$3.75/MF$1.45
Yale Univ New Haven Conn School of Medicine
WORLD REFERENCE CENTER FOR ARBOVIRUSES.
Annual progress rept. 1 Jul 72-30 Jun 73,
Robert E. Shope. 1 Jul 73, 77p* Rept no. 43063-73-1
Contract DADA17-72-C-2170

Descriptors: (*Arboviruses, Standards), Immune serums, Identification, Classification, Serodiagnosis, Tissue culture, Culicidae, Mammals, Virus diseases, Viruses.

The Yale Arbovirus Research Unit serves the military and other agencies as an arbovirus reference center to identify viruses, serologically diagnose disease, prepare and distribute reference reagents and virus stocks, conduct serological surveys, and develop new techniques in arbovirology. Viruses and/or antisera to 197 strains were received from 20 foreign countries and the USA for identification. Those identified included 2 new Kemerovo group viruses, a new rabies-related agent, and 11 known viruses from new geographical areas. Serological classifications in the DGK, Changuinola, and arbo-A groups were made or revised. A presumed insect-pathogenic virus was characterized in mosquito cell culture. The reference center distributed 1385 ampoules of reagents to laboratories in the USA and 19 other countries. Mosquito and mammalian cell cultures were supplied to laboratories in the USA and six other nations. Sero survey in British Honduras showed that the HI test was useful to evaluate VEE vaccine. Another survey in Iran demonstrated Crimean hemorrhagic fever virus antibody in a wide variety of animals and man. (Modified author abstract) Portions of this document are not fully legible.

AD-768 890/6GA PC$2.75/MF$1.45
Ohio State Univ Research Foundation Columbus
ISOLATION AND CHARACTERIZATION OF 'PLASMODIUM BERGHEI' ANTIGENS.
Annual rept.,
Julius P. Kreier. Oct 72, 8p
Contract DADA17-72-C-2072

Descriptors: (*Plasmodium, *Antigens + antibodies), Parasites, Erythrocytes, Acoustic equipment, Separation, Serodiagnosis, Identification.
Identifiers: Malaria, Plasmodium berghei, Plasmodium gallinaceum.

A continuous flow sonic system and various other methods for freeing malaria parasites from their host erythrocytes were evaluated from the standpoint of the morphological integrity of the freed parasites and the utility of the freed parasites as sources of antigen for serological tests. The antigens obtained from the parasites freed by the sonic system were evaluated by complement fixation, passive hemagglutination, and gel diffusion. (Modified author abstract)

AD-768 928/4GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
EXPERIMENTE UEBER DEN EINFLUSSE VON METABOLITEN UND ANTIMETABOLITEN AM MODELL VON TRICHOMONAS VAGINALIS. I. MITTEILUNG EXPERIMENTE MIT DEM VITAMIN B2-KOMPLEX (EXPERIMENTS ON THE INFLUENCE OF METABOLITES AND ANTIMETABOLITES ON THE MODEL OF TRICHOMONAS VAGINALIS. I. COMMUNICATION: EXPERIMENTS WITH THE VITAMIN-B2-COMPLEX),
Chr. P. Christow. 20 Sep 70, 22p
Text in German; attached summary in English. See also AD-768 929.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt Originale (West Germany) vA-217 p381-402 1971.

Descriptors: (*Protozoa, Reproductive system), (*Vitamin B complex, Protozoa), Parasites, Metabolism, West Germany, Vitamins.
Identifiers: *Trichomonas vaginalis.

The fact that vitamins are acting as essential factors in the metabolic processes of the cells of macroorganisms justifies also investigations on their influence upon environmental microorganisms that have penetrated the macroorganism. Relations between the vitamins of the B2-complex and the pathogenic protozoa Trichomonas vaginalis have been studied. Material and methods are described in the paper. The efficacy of the individual admixtures from the vitamin-B2-complex is subsequently discussed. (Author)

AD-768 929/2GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
EXPERIMENTE UEBER DEN EINFLUSSE VON METABOLITEN UND ANTIMETABOLITEN AM MODEL VON TRICHOMONAS VAGINALIS. II. MITTEILUNG: EXPERIMENTE MIT DER VITAMIN K-GRUPPE (EXPERIMENTS ON THE INFLUENCE OF METABOLITES AND ANTIMETABOLITES ON THE MODEL OF TRICHOMONAS VAGINALIS. II. COMMUNICATION: EXPERIMENTS WITH THE VITAMIN K-GROUP),
Chr. Petrow Christow. 30 Sep 70, 13p
Text in German; attached summary in English. See also AD-768 928 and AD-768 930.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt Originale (West Germany) vA-218 p116-127 1971.

Descriptors: (*Protozoa, Reproductive system), (*Vitamin K, Protozoa), Metabolism, Parasites, Vitamins, West Germany.
Identifiers: *Trichomonas vaginalis.

The aim of the investigation was to test the relationship between the individual K-vitamins K1, K3, K4 and K5 and Trichomonas analytically. The experiments were performed with the strains Nussbaum, Alexander, Tolksdorf, Bergit, Schuster and Wenzel. The experiments performed with vitamin K1 did not show any remarkable differences between the control culture and the test series (Table 1) in Trichomonas multiplication. With vitamin K3 gradually inhibiting action could be demonstrated (Table 2); at concentrations of 0.08 to 0.16 mg/ml decrease of Trichomonas growth may be observed. With vitamin K4 essential reduction of multiplication of Trichomonas vaginalis was observed within a range of 0.25 and 0.35 mg/ml, from 0.40 mg/ml onward single Trichomonas could be noted during the first few days following inoculation. The experiments with vitamin K5 took similar course as those with K4 (Tables 4 and 7). There occured a decrease in multiplication and viability of Trichomonas. (Modified author abstract)

AD-768 930/0GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
EXPERIMENTE UEBER DEN EINFLUSSE VON METABOLITES UND ANTIMETABOLITEN AM MODELL VON TRICHOMONAS VAGINALIS. III. MITTEILUNG: EXPERIMENTE MIT ESSENTIELLEN FETTSAEUREN (EXPERIMENTS ON THE INFLUENCE OF METABOLITES AND ANTIMETABOLITES ON THE MODEL OF TRICHOMONAS VAGINALIS. III. COMMUNICATION: EXPERIMENTS WITH ESSENTIAL FATTY ACIDS),
Chr. Petrow Christow. 30 Sep 70, 11p
Text in German; attached abstract in English. See also AD-768 929 and AD-768 931.

Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-218 p128-137 1971.

Descriptors: (*Protozoa, Reproductive system), (*Fatty acids, Protozoa), Metabolism, Vitamins, Parasites, West Germany.
Identifiers: *Trichomonas vaginalis.

The relationship between the double and trifold unsaturated fatty acids and Trichomonas vaginalis was tested. The experiments aimed at testing the influence of vitamin F, linolic and linoleic acid upon multiplication of Trichomonas vaginalis. Vitamin F exerts trichomonacidal effect upon Trichomonas vaginalis cultures. Linolic acid alone does not yet show great differences at concentrations of 0,01 to 0.05 mg/ml, as compared to the controls. At 0.10 mg/ml inhibiting action may be noticed and, at a concentration of 0.20 mg/ml the cell number is heavily reduced. Linoleic acid exerts essential influence upon Trichomonas multiplication within a concentration range of 0.01 to 0.10 mg/ml. At concentrations from 0.20 mg/ml onward, heavy reduction in the Trichomonas population was noticed. (Modified author abstract)

AD-768 931/8GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
EXPERIMENT UEBER DEN EINFLUSSE VON METABOLITEN UND ANTIMETABOLITEN AM MODELL VON TRICHOMONAS VAGINALIS. IV. MITTEILUNG: VITAMINE, DIE DAS WACHSTUM VON TRICHOMONAS VAGINALIS BEGUENSTIGEN (EXPERIMENTS ON THE INFLUENCE OF METABOLITES AND ANTIMETABOLITES ON THE MODEL OF TRICHOMONAS VAGINALIS. IV. COMMUNICATION: VITAMINS FAVOURING THE GROWTH OF TRICHOMONAS VAGINALIS),
Chr. P. Christow. 30 Sep 70, 9p
Text in German: attached summary in english. See also AD-768 930 and AD-768 932.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-218 p13 p138-145 1971.

Descriptors: (*Protozoa, Reproductive system), (*Vitamins, Protozoa), Metabolism, Growth, Parasites, West Germany.
Identifiers: *Trichomonas vaginalis.

A number of vitamins have been investigated for their influence upon Trichomonas vaginalis. At a concentration of 0.20 mg ml vitamin A has stimulating action upon the growth of Trichomonas vaginalis. Vitamin D2 has been shown to favour Trichomonas multiplication in all experimental series. Vitamin D3 generally favours the Trichomonas vaginalis population. Addition of vitamin E resulted in enhanced multiplication of Trichomonas and longer duration of life. In the presence of rutin the experimental Trichomonas cultures show identical behaviour to the control series. In all of the strains tested the growth of Trichomonas vaginalis was identical to that of the control series at concentrations up to 10 mg/ml. At higher concentrations a decrease in multiplication was noted. (Author)

AD-768 932/6GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
EXPERIMENTE UEBER DEN EINFLUSSE VON METABOLITEN UND ANTIMETABOLITEN AM MODELL VON TRICHOMONAS VAGINALIS. V. MITTEILUNG: BEZIEHUNGEN DER VITAMIN-B-KEMPLEXE ZU TRICHOMONAS VAGINALIS (EXPERIMENTS ON THE INFLUENCE OF METABOLITES AND ANTIMETABOLITES ON THE MODEL OF TRICHOMONAS VAGINALIS. V. COMMUNICATION: RELATIONSHIP BETWEEN VITAMIN-B-COMPLEXES AND TRICHOMONAS VAGINALIS),
Chr. P. Christow. 30 Sep 70, 18p
Text in German; attached summary in English. See also AD-768 931 and AD-768 933.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-218 p232-248 1971.

Descriptors: (*Protozoa, Reproductive system), (*Vitamin B complex, Protozoa), Metabolism, Growth, Vitamins, Parasites, West Germany.
Identifiers: *Trichomonas vaginalis.

The present study was concerned with the relationship between the vitamins of the B-complex and Trichomonas. From the results obtained in studies on vitamin B1 clear evidence of any influence upon Trichomonas growth could not be obtained. Choline favours the growth of Trichomonas vaginalis. In the experimental series with adenine from 1.4 mg/ml onward inhibiting effect upon the Trichomonas population was noted. Vitamin B6 has no clear effect upon Trichomonas, therefore, an analytical study with its individual forms, pyridoxine, pyrodoxal, pyridoxamine, would be desirable. The three forms of vitamin B6 show differing action upon other microorganisms. Biotin (vitamin H = vitamin B1) showed favourable action upon all Trichomonas strains. Adenylic acid could be shown to influence Trichomonas growth favourably. Meso-inosite favoured Trichomonas multiplication. At concentrations from 0.20 mg/ml onward liponic acid had inhibiting effect upon Trichomonas. Carnitine chloride favoured the growth of Trichomonas vaginalis. (Modified author abstract)

AD-768 933/4GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
EXPERIMENTE UEBER DEN EINFLUSSE VON METABOLITEN UND ANTIMETABOLITEN AM MODELL VON TRICHOMONAS VAGINALIS. VI. MITTEILUNG: EINWIRKUNG EINIGER VITAMINAEHNLICHER SUBSTANZEN AUF DAS WACHSTUM VON TRICHOMONAS VAGINALIS (EXPERIMENTS ON THE INFLUENCE OF METABOLITES AND ANTIMETABOLITES ON THE MODEL OF TRICHOMONAS VAGINALIS. VI. COMMUNICATION: EFFECT OF VITAMINS AND VITAMIN-LIKE SUBSTANC - TRN
Chr. Petrow Christow. 30 Sep 70, 8p
Text in German; attached summary in English. See also AD-768 932 and AD-768 934.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-218 p525-532 1971.

Descriptors: (*Protozoa, Reproductive system), (*Vitamins, Protozoa), Metabolism, Growth, Vitamins, Parasites, West Germany.
Identifiers: *Trichomonas vaginalis.

A number of substances (folic acid, axerophtol, tokopherol and others) stimulate the growth of Trichomonas vaginalis and, therefore, are very well suited for trichomonas media. The presence of these substances in the urogential system of man could favour occasional trichomonas affection. A second group of vitamins (thiamine, lactoflavin, pyridoxine and others) are without recognizeable effect upon the growth of Trichomonas vaginalis. The third group of substances (nicotic acid amide, liponic acid, xanthopterin, vitamin F, menadion and others) seem to be especially interesting since they show inhibiting effect upon the growth of Trichomonas vaginalis. Further investigations with these substances within a combined inhibition system seem to be important. (Modified author abstract)

AD-768 934/2GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
EXPERIMENTE UEBER DEN EINFLUSSEE VON METABOLITEN UND ANTIMETABOLITEN AM MODELL VON TRICHOMONAS VAGINALIS. VII. MITTEILUNG: EXPERIMENTE MIT ANTIMETABOLITEN (EXPERIMENTS ON THE INFLUENCE OF METABOLITES AND ANTIMETABOLITES ON THE MODEL OF TRICHOMONAS VAGINALIS. VII. COMMUNICATION: EXPERIMENTS ON ANTIMETABOLITES),
Chr. Petrow Christow. 30 Sep 70, 9p
Text in German; attached summary in English. See also AD-768 933 and AD-768 935.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-218 p533-541 1971.

Descriptors: (*Protozoa, Reproductive system), (*Antimetabolites, Protozoa), Metabolism, Growth, Parasites, West Germany.
Identifiers: *Trichomonas vaginalis.

Antivitamin testing took place in vitro since in this manner all factors may be better considered in experiment. The test series were carried out with six trichomonas strains and the following antivitamins: aminopterine, acetylpyridine, pyridine sulfonic acid, aminobutyric acid, pantoyltaurin, benzimidazol, 5.6-dimethyl-benzimidazid, azaadenin, avidine, phthiocol, dicumarol, tri-o-cresylphosphate, di-o-cresylacetate. Growth of trichomonas in the experiments with aminopterine, tri-o-creaylphosphate and di-o-cresylacetate was within the range of the control cultures. Similar were the results obtained with azaadenine and avidine, aminobutyric acid and pantoyltaurine. An inhibiting effect as a function of the concentration series was noticed with acetylpyridine and pyridine sulfonic acid. Tests with benzimidazole and 5.6-dimethylbenzimidazole resulted in a trichomonastatic effect from concentrations above 0.80 mg/ml. A clear inhibiting effect upon the development of trichomonas cultures was seen with phthiocole at a concentration of 0.80 mg/ml. Considerably weaker was the inhibiting action of the series with the addition of dicumarol. (Modified author abstract)

AD-768 935/9GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
EXPERIMENTE UEBER DEN EINFLUSSE VON METABOLITEN UND ANTIMETABOLITEN AM MODELL VON TRICHOMONAS VAGINALIS. VIII. MITTEILUNG: EXPERIMENTS MIT HORMONEN (EXPERIMENTS ON THE INFLUENCE OF METABOLITES AND ANTIMETABOLITES ON THE MODEL OF TRICHOMONAS VAGINALIS. VIII. COMMUNICATION: EXPERIMENTS WITH HORMONES),
Chr. Petrow Christow. 30 Sep 70, 12p
Text in German; attached summary in English. See also AD-768 934 and AD-768 936.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-218 p542-552 1971.

Descriptors: (*Protozoa, Reproductive system), (*Hormones, Protozoa), Metabolism, Growth, Parasites, Sex hormones, Testosterone, West Germany.
Identifiers: *Trichomonas vaginalis.

The present study has been concerned with the influence of some hormones upon trichomonas growth. The following substances were used for our experiments: serotonin, oestron, progesteron, hydroxyprogesteron, adrenalin, testosteron, methyltestosteron, and the antihoromone 3.5-dijodtyrosine. The experiments were performed on 7 trichomonas vaginalis strains. The test cultures with serotonin, oestron, testosteron and methyltestosteron grew at concentrations from 0.20 to 6.0 mg/ml as well as the control cultures. Inhibiting action, especially at a concentration of 0.80 mg/ml could be demonstrated in the experiments with progesteron. Slightly inhibiting action was noted in the experiments with hydroxyprogesteron from concentrations of 3.0 mg/ml onward. Adrenalin and noradrenalin have generally inhibiting action (from 0.80 mg/ml onward) upon trichomonas growth. The antihormone 3.5-dijodtyrosin does rarely influence the growth of trichomonas. (Author)

AD-768 936/7GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
EXPERIMENTE UEBER DEN EINFLUSSE VON METABOLITEN UND ANTIMETABOLITEN AM MODELL VON TRICHOMONAS VAGINALIS. IX. MITTEILUNG: EXPERIMENTE MIT ENZYMEN (EXPERIMENTS ON THE INFLUENCE OF METABOLITES AND ANTIMETABOLITES ON THE MODEL OF TRICHOMONAS VAGINALIS. IX. COMMUNICATION: EXPERIMENTS ON ENZYMES),
Chr. Petrow Christow. 30 Sep 70, 4p
Text in German; attached summary in English. See also AD-768 935.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-218 p553-556 1971.

Descriptors: (*Protozoa, Reproductive system), (*Enzymes, Protozoa), Metabolism, Growth, Parasites, West Germany.
Identifiers: *Trichomonas vaginalis.

The digestive enzymes may be of special interest with regard to oral trichomonas infection. We have made it our task to demonstrate the relations of some enzymes to trichomonas. The following enzymes were used for experiment: pepsin, trypsin, distaste, urease and lysozyme. Tests were performed on six trichomonas strains and evaluated by microscopical readings and determination of the population density at varying concentrations of the substances. In all strains and at all concentrations (0.20-6.0 mg/ml) good growth of trichomonas was observed. The cultures of the experimental series with trypsin behaved likewise. Favourable effect upon trichomonas growth was also seen in the experiments with diastase. Similar results were also obtained in the experiments with urease. Trichomonas growth under addition of lysozyme was within the range of the control cultures. (Modified author abstract)

AD-768 937/5GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
HEPATITIS BEI AFFEN NACH VERIMPFUNG VON ADENOVIREN AUS MENSCHEN MIT VIRUSHEPATITIS. IV. IMMUNISIERUNGS- UND BELASTUNGSVERSUCHE (HEPATITIS IN MONKEYS FOLLOWING INOCULATION OF ADENOVIRUS ISOLATED FROM VIRUS HEPATITIS PATIENTS. IV. IMMUNIZATION- AND CHALLENGE TRIALS),
H. Koehler, J. Apodaca, and W. Lange. 6 Nov 68, 11p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene. I. Originale (West Germany) v209-S p423-433 1969.

Descriptors: (*Adenoviruses, *Hepatitis viruses), (*Immunity, Hepatitis viruses), Monkeys, Infectious diseases, Histology, Laboratory animals, Etiology, West Germany.

Marmoset monkeys contracted hepatitis after having been infected with adenovirus isolated from hepatitis patients, which could be proved by enzyme values and histological findings. Re- or superinfection of the animals was carried out during their reconvalescence by injecting a long-passaged infectious monkey serum which, when administered intramuscularly, proved capable of inducing hepatitis in all infected and all unpretreated monkeys. Regardless of the fact, whether the infectious monkey serum used for challenge originated from the own laboratory or from Dr. Deinhardt, USA, nine out of 11 monkeys remained healthy. The significance of the presented experimental results with a view to the etiological elucidation of human virus hepatitis is being discussed.

AD-768 938/3GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
HISTOLOGISCHE UNTERSUCHUNGEN AN EXPERIMENTELL MIT SALMONELLA TYPHI INFIZIERTEN MEERSCHWEINCHEN (TYPHUSBAKTERIENAUSSCHEIDER) (HISTOLOGICAL INVESTIGATIONS ON GUINEA PIGS (TYPHOID BACTERIA EXCRETORS) EXPERIMENTALLY INFECTED WITH SALMONELLA TYPHI),
E. Mertens, and G. Henneberg. 15 Jul 68, 18p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene. I. Originale (West Germany) v209-S p169-186 1969.

Descriptors: (*Salmonella typhosa, Infections), Guinea pigs, Excretion, Histology, Pathology, Experimental data, West Germany.
Identifiers: *Typhoid.

Guinea pigs were infected with Salmonella typhi by injecting the bacterial culture into the exposed gallbladder. Some of the animals became typhoid bacteria excretors; still on the 104th and 114th day, respectively, S. typhi were demonstrable in fecal and urine mixtures. During the histological examination of the organs, small-cell infiltrates were noted in the gallbladders and kidneys, possibly suggesting latent chronical infection. Demonstration beyond doubt of intracellularly located S. typhi in the tissues of the gallbladders, the latter being very often to some extent cirrhotic, was not successful by means of staining. (Author)

AD-768 940/9GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
IMMUNOGENITAET MYCOBAKTERIELLER ZELLWAENDE GEGEN EXPERIMENTELLE AEROGENE TUBERKULOSEINFEKTION DER MAUS (IMMUNOGENICITY OF MYCOBACTERIAL CELL WALLS AGAINST EXPERIMENTAL AIRBORNE TUBERCULOSIS),
Werner Brehmer, William R. Barclay, Robert L. Anacker, Kelsey C. Milner, and Edgar Ribi. 1969, 23p
Text in German; attached summaries in English, French, and Russian. Prepared in cooperation with Chicago Univ., Ill. Dept. of Medicine and Ivan Sorvall, Inc., Norwalk, Conn.
Availability: Pub. in Zeitschrift fuer Immunitaetsforschung, Allergie und Klinische Immunologie (West Germany) v137 p37-59 1969.

Descriptors: (*Mycobacterium tuberculosis, Cell wall), (*Immunity, Mycobacterium tuberculosis), (*Vaccines, Mycobacterium tuberculosis), Infections, Bacterial aerosols, West Germany.

As in cade of other bacteria so far tested the immunogenic factors of Mycobacteria also seem to be located in or upon the cell wall. The immunogenic potency of mycobacterial cell wall-vaccines has been examined in parallel with viable BCG-vaccine in mice against airborne infection with virulent tubercle bacilli. Mycobacterial cell walls afford protection only when administered by the intravenous route as an oil-in water-emulsion. So far, only mineral oils and the synthetic hydrocarbon 7-hexyloctadecane were found suitable to function as carriers for the cell wall material. In this test system the degree of immunity obtained was in parallel with a considerable proliferation of macrophages and lymphocytes in lungs and spleens of the mice. (Modified author abstract)

AD-768 943/3GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
DARMINVAGINATIONEN BEI KRALLENAFFEN DER SPECIES SAGUINUS (OEDIPOMIDAS) OEDIPUS ALS MOEGLICHE FOLGE VON INFEKTIONEN MIT ADENOVIREN (INTESTINAL INVAGINATION IN MONKEYS OF THE SPECIES SAGUINUS (OEDIPOMIDAS) OEDIPUS AS A POSSIBLE CONSEQUENCE OF ADENOVIRUS INFECTION),
W. Lange, J. Apodaca, and H. Koehler. 24 Jan 69, 11p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene. I. Originale (West Germany) v210-S p337-347 1969.

Descriptors: (*Adenoviruses, Intestines), (*Intestines, Pathology), Infections, Viruses, Monkeys, Experimental data, West Germany.

During the course of investigations on experimentally induced hepatitis in monkeys of the species Saguinus (Oedipomidas) oedipus, increased incidence of intestinal invaginations has been observed. The monkeys had been infected with adenovirsu or with sera of monkeys suffering from experimentally produced hepatitis. Previously it could be demonstrated that these sera contained in all probability adenovirus. Non-infected monkeys, however, have been found to be infected with adenovirus only in very rare cases. Intestinal invagination was seen in 24 out of 204 infected monkeys and in 2 out of 450 non-infected monkeys. Intranuclear inclusions, similar to adenovirus inclusions were demonstrated in the intestinal epithelium of infected monkeys, both with invagination and without this symptom. Adenovirus antigen was demonstrated in the intestinal epithelium of some of these monkeys by means of indirect immunofluorescence. Virus isolations could not be made. Nevertheless, the findings described in the present paper might be indicative for adenovirus multiplication in the intestinal epthelium of experimentally infected monkeys. (Modified author abstract)

AD-768 944/1GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
UNTERSUCHUNGEN UEBER DIE KULTIVIERUNG UND BIOLOGIE VON TRICHOMONAS VAGINALIS (INVESTIGATION ON CULTIVATION AND BIOLOGY OF TRICHOMONAS VAGINALIS),
Chr. Petrow Christow. 30 Sep 70, 15p
Text in German; attached abstract in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) v217 p549-553 1971.

Descriptors: (*Protozoa, Biology), (*Reproductive system, Protozoa), Growth, Physiology, Metabolism, Vitamins, Enzymes, Hormones, Parasites, West Germany.
Identifiers: *Trichomonas vaginalis.

Since long possible cyst formation by Trichomonas vaginalis has been discussed. According to our observations the round forms of Trichomonas generally appear as degenerative manifestations of the cell, especially in older cultures. We tried to study analytically the biology of Trichomonas vaginalis in relation to its biogenic surroundings. Here the biochemico-physiological relationship between Trichomonas and the fundamental biogenic substances involved in the manifold metabolic processes of the macroorganism is of special interest. The three metabolite groups, vitamins, enzymes and hormons were taken into special consideration. (Modified author abstract)

AD-768 945/8GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
MECHANISMS OF ORAL IMMUNIZATION WITH INACTIVATED MICROORGANISMS,
Hansjuergen Raettig. 1970, 10p
Proceedings of the International Congress of the Microbiological Society (11th) Held in Milan (Italy) in 1968.
Availability: Pub. in Progress in Immunobiological Standardization, v4 p337-346 1970.

Descriptors: (*Immunity, *Infectious diseases), (*Vaccines, Ingestion(Physiology)), (*Antigens + antibodies, Microorganisms), Bacteria, Experimental data, Epidemiology, West Germany.

An orally introduced antigen will, due to paracellular persorption through the epithelium of the small intestine enter in the lymph and then into the blood. These antigens in the circulation can be evidence for some time. On the other hand the antigen is secreted from the circulation through the mucosa of the respiratory and digestive tracts. Because of the secretion and persorption a circulation of the antigen is established. To an antigen orally introduced the cells of the gut are evidencing a primary reaction. The presence of circulating antibodies is probably a secondary response, especially after a subsequent homologous infection. Evidence reagins resulting from orally introduced antigens are probably responsible for the protective effect towards an infection, achieved after an orally administered antigen. The latter is postulated from results of experiments on animal and man. The important practical advantage of oral immunization is discussed.

AD-768 947/4GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
OBJEKTIVE BESTIMMUNG DER INDIREKTEN HAEMAGGLUTINATION NACH BOYDEN AUF GRUND DER BELEGUNG EINER GENEIGTEN OBERFLAECHE (OBJECTIVE EVALUATION OF INDIRECT HEMAGGLUTINATION (BOYDEN) BASED UPON THE 'COATING' ON AN INCLINED SURFACE),
Rudolf Sonak, Heinz Pichl, and Rolf Mosbach. 11 Sep 70, 12p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) v216 p506-516 1971.

Descriptors: (*Serodiagnosis, Test methods), (*Antigen-antibody reactions, Test methods), West Germany.
Identifiers: *Hemagglutination.

Described is a new method for the determination of indirect hemagglutination according to Boyden. In principle, the method consists in measuring the extent of 'coating' (B) formed on an inclined surface, thus B giving a measure of aggregation (hemagglutination). Coating is intensified by increasing antibody concentration. Two immunological systems, tetanus toxoid-antitoxin and human serumalbumin-antihuman serumalbumin, have been chosen to demonstrate the high sensitivity, exactness, and good reproducibility of this method. (Modified author abstract)

AD-768 948/2GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
UEBER BEOBACHTUNGEN AN MARMOSET-AFFEN SAGUINUS (OEPIDOMIDAS) OEDIPUS NACH ORALER UND INTRAPERITONEALER INFEKTION MIT VERSCHIEDENEN ZYSTEN-BILDENDEN TOXOPLASMA-STAEMMEN UNTERSCHIEDLICHER VIRULENZ. I. MITTEILUNG: KLINISCHE, PATHOLOGISCHE BEFUNDE (OBSERVATIONS ON MARMOSET MONKEYS OF THE SPECIES SAGUINUS (OEDIPOMIDAS) OEDIPUS),
H. Werner, K. Janitschke, and H. Koehler. 26 Nov 68, 17p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene. I. Originale (West Germany) v209-S p553-569 1969.

Descriptors: (*Toxoplasma, *Infections), Protozoa, Parasitic diseases, Pathology, Medicine, Monkeys, Experimental data, West Germany.

Twenty eight marmoset monkeys (Saguinus (Oedipomidas) oedipus) were infected either orally or intraperitoneally by cyst-forming Toxoplasma strains, both virulent and avirulent for mice. All monkeys died between the 6th and 17th days following infection of acute toxoplasmosis. In spite of the fact that the infective doses as well as degree of virulence and routes of infection varied, clinical course and pathological-anatomical picture of infection were the same in all monkeys. Differences were only noted in the histopathological findings of the duodenum. The inflammative signs observed ranged from superficial erosion of the mucous membrane to extensive necroses that penetrated deeply into the submucosa. In nearly all organs as well as in peritoneal exudate toxoplasms were demonstrated in animal experiments both microscopically and histologically. In all instances the mucosa and submucosa of the duodenum proved to be most affected. Differences were observed in the morphological structure and stainability of the trophozoite and proliferative forms of the parasites. (Modified author abstract)

AD-768 949/0GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
ORALE IMMUNISIERUNG MIT NICHTVERMEHRUNGSFAEHIGEN MIKROORGANIEMEN ODER IHREN ANTIGENEN. 10. MITTEILUNG: SEROLOGISCHE PRIMAER- UND SEKUNDAERANTWORT NACH ORALER IMPFUNG MIT S. TYPHI MURIUM-VOLLANTIGEN IM VERGLEICHENDEN TIEREXPERIMENT (ORAL IMMUNISATION WITH INACTIVATED MICROORGANISMS OR THEIR ANTIGENS. 10),
Hansjuergen Raettig, and Aletta Buse. 5 Nov 69, 17p
Text in German; summary in English. See also AD-768 950.
Availability: Pub. in Zentralblatt Fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) v214 p216-230 1970.

Descriptors: (*Vaccines, Ingestion(Physiology)), (*Salmonella, Vaccines), (*Immunity, Salmonella), Antigens + antibodies, Serodiagnosis, Effectiveness, Laboratory animals, Experimental data, West Germany.
Identifiers: Salmonella typhimurium.

Oral vaccination with heat-inactivated S. typhi murium bacteria does hardly induce increases in the hemagglutinating antibodies in the white mouse. Only after homologous, oral infection, there will occur a strong booster reaction. The duration of the immunological reactivity is very long. Guinea pigs give other reactions to the same oral vaccination than mice. In these animals the HAT-values increase heavily after primary immunisation and remain at medium level over 240 days. Similar to the guinea pigs rabbits show good increase in the HAT after primary vaccination. Very young calves show again other reactions. After oral vaccination, similar to mice, hemagglutinating antibodies are hardly produced. After oral infection with virulent S. typhi murium bacteria there occurs a typical booster reaction. Following subcutaneous vaccination the antibody curve takes a reverse course. Good HAT-values are observed in primary reaction , however, after oral infection any booster reaction fails to appear. (Modified author abstract)

AD-768 950/8GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
ORALE IMMUNISIERUNG MIT NICHTVERMEHRUNGSFAEHIGEN MIKROORGANISMEN ODER IHREN ANTIGENEN. 11. MITTEILUNG: WIRKSAMKEIT VON KOMBINATIONSIMPFSTOFFEN AUS ENTEROBAKTERIAZEEN-VOLLANTIGEN IM MAEUSESCHUTZTEST (ORAL IMMUNIZATION WITH NON-LIVING MICROORGANISMS OR THEIR ANTIGENS. 11.),
Hansjuergen Raettig, and Angelika Marquardsen. 16 Mar 70, 22p
Text in German; summary in English. See also AD-768 949 and AD-768 951.

Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany), v215 p296-315 1970.

Descriptors: (*Vaccines, Ingestion(Physiology)), (*Enterobacteriaceae, Vaccines), Immunity, Bacteria, Antigens + antibodies, Mice, Experimental data, West Germany.

NMRI-mice are immunised orally on 10 subsequent days with heatinactivated complete antigens from Enterobacteriaceae (3-5 min/100C) using an esophageal sound. Ten days after the last oral vaccination the animals are infected intraperitoneally. The protective action is estimated by the mortality rate. Four combined vaccines are tested for comparison purposes with the monovalent specific vaccination: one bivalent vaccine consisting of S. schwarzengrund and E. coli 2380 (O111:B4:H12), one trivalent vaccine consisting of S. typhi murium, Sh. flexneri 2a and E. coli 2380, one quintvalent vaccine under addition of S. schwarzengrund and S. blockley and one vaccine consisting of 16 different antigens (10 Salmonellae, 4 Shigellae and 2 dyspepsia coli strains). The combined vaccines showed better effectiveness than expected. The combined vaccine of 16 antigens did also show better effectiveness than vaccination with 1/16 of the monovalent vaccine. All differences in the mortality of combined vaccinated and unvaccinated mice are statistically significant. (Modified author abstract)

AD-768 951/6GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
ORALE IMMUNISIERUNG MIT NICHTVERMEHRUNGSFAEHIGEN MIKROORGANISMEN ODER IHREN ANTIGENEN. 12. MITTEILUNG: IMMUNOGENITAET VERSCHIEDEN INAKTIVIERTER S. TYPHI MURIUM-VOLLANTIGENE IM MAEUSESCHUTZTEST (ORAL IMMUNIZATION WITH NON-LIVING MICROORGANISMS OR THEIR ANTIGENS. 12),
Ingrid Kordes, Bernd Kordes, Heinz Pichl, Baerbel Ganze, and Hansjuergen Raettig. 21 May 70, 14p
Text in German: summary in English. See also AD-768 950 and AD-768 952.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany), v217 p242-253 1971.

Descriptors: (*Vaccines, Ingestion(Physiology)), (*Salmonella, Vaccines), Bacteria, Antigens + antibodies, Immunity, West Germany, Mice, Experimental data.
Identifiers: Salmonella typhimurium.

White mice were on ten subsequent days orally immunised by an oesophageal sound. Seven to fourteen days following the last oral vaccination all of the mice were infected orally with virulent S. typhi murium bacteria. The infective dose was adjusted to LD50. The vaccine consisted of S. typhi murium bacteria inactivated by different physical or chemical methods. The protein-denaturating inactivation methods (DMSO and HBO-uv-rays) destroy the immunogenicity. Vaccines obtained by application of acetone inactivation, formaldehyde-treatment, DNA-absorbed uv-rays and low temperatures yield medium protection values. The immunogenicity of the vaccines is improved by increasing the inactivation temperature and decreasing the period of treatment. The most effective vaccine was obtained by heating to 100C for three minutes. (Modified author abstract)

AD-768 952/4GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
ORALE IMMUNISIERUNG MIT NICHTVERMEHRUNGSFAEHIGEN MIKROORGANISMEN ODER IHREN ANTIGENEN. 13. MITTEILUNG: PERSORPTION UND SEKRETION VON MIKROORGANISMEN IM TIERVERSUCH (ORAL IMMUNIZATION WITH NON-LIVING

MICROORGANISMS OR THEIR ANTIGENS. 13),
Elvira Schlewinski, Nikolaus Graben, Josefine Funk, Eckhard Sahm, and Hansjuergen Raettig.
25 Jan 71, 13p
Text in German; summary in English. See also AD-768 951 and AD-768 953.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany), v218 p93-104 1971.

Descriptors: (*Vaccines, Ingestion(Physiology)), (*Immunity, *Microorganisms), Antigens + antibodies, Intestines, Sorption, Secretion, West Germany.

Live phages and Col-SK-viruses as well as inactivated, radiomarked S. typhi murium bacteria after oral induction are persorbed by the intestine of the mouse and soon appear in the blood. These experiments were extended by three more test models: live staphylococci and S. typhi murium bacteria as well as C. albicans germs. The test organisms are persorbed rather independent on the replication state, the size, and the quantity of the test organisms. The time curves are so similar that there a generally valid norm curve of persorption kinetics could be developed. This curve attains its climax between 30 and 60 min. after induction of the germs and declines to the nadir after 8 hours. If phages are induced by the intravenous route as test model they occur at the same speed in the opposite direction in the gastric contents; the curve of this secretion is very similar to that of the persorption. The courses of persorption are described as Herbst-effect by experiments of Volkheimer and co-workers. According to this, orally induced particles may be persorbed in the body up to a size of 50 microns paracellulary by the mucosal epithelium of the small intestine. In that way the oral vaccination becomes effective. (Author)

AD-768 953/2GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
ORALE IMMUNISIERUNG MIT NICHTVERMEHRUNGSFAEHIGEN MIKROORGANISMEN ODER IHREN ANTIGENEN. 14. MITTEILUNG: AKTIVE UND PASSIVE IMMUNISIERBARKEIT VON BABYMAEUSEN GEGENUEBER EINER S. TYPHI MURIUM-INFEKTION (ORAL IMMUNIZATION WITH NON-LIVING MICROORGANISMS OR THEIR ANTIGENS. 14),
Hansjuergen Raettig, and Baerbel Ganze. 11 Feb 71, 12p
Text in German; summary in English. See also AD-768 952.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany), v218 p310-319 1971.

Descriptors: (*Salmonella, Vaccines), (*Vaccines, Ingestion(Physiology)), (*Immunity, Salmonella), Mice, Infants, Pregnancy, Bacteria, West Germany, Experimental data.
Identifiers: *Salmonella typhimurium.

Baby mice, being fed with heat-inactivated S. typhi murium complete antigen, develope an immunity measured by protection against a homologous oral infection. Not only after oral but also after subcutaneous vaccination this protection is demonstrable. Baby mice can further be protected by an active immunization of the pregnant mother animal; litters of orally or subcutaneously vaccinated mother animals are significantly protected against an oral infection within the first week of their life. (Author)

AD-768 954/0GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
UEBER DIE STAMMSPEZIFITAET VON SERUMINHIBITOREN. VERGLEICHENDE SEROLOGISCHE UNTERSUCHUNGEN MIT DEN INFLUENZAVIRUSSTAEMMEN A2BERLIN/2/68 UND A2/HONG KONG/1/68 (ON STRAIN-SPECIFICITY OF SERUM INHIBITORS. COMPARATIVE SEROLOGICAL INVESTIGATIONS ON THE INFLUENZA VIRUS STRAINS A2/BERLIN/2/68 AND A2/HONG KONG/1/68),
Grigorios Antoniadis, and Marina Woytek. 9 Feb 70, 13p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) v214 p186-197 1970.

Descriptors: (*Influenza virus, Serodiagnosis), Antigens + antibodies, Identification, Viruses, West Germany.
Identifiers: Hemagglutination inhibition tests.

The present paper reports on tests performed with the aim to determine possibly existing differences in the behaviour of the influenza virus strains A2/Berlin/2/68 and A2/Hong Kong/1/68 towards inhibitors contained in the sera of man and different animal species. Beyond this, experiments were carried out to check in the HI-test the possible existence of an antigenic relationship between the two strains under special consideration of the influence of serum inhibitors upon the results of the HI-test, and the possibly existing degree of a true cross reaction after complete elimination of the serum inhibitors specific for the two virus strains on the basis of the corresponding chicken immune sera. (Modified author abstract)

AD-768 955/7GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
ZUM VERHALTEN VON HEPATITIS ASSOCIATED ANTIGEN (HAA) BEI PATIENTEN MIT VIRUSHEPATITIS (ON THE BEHAVIOUR OF HEPATITIS ASSOCIATED ANTIGEN (HAA) IN PATIENTS WITH VIRAL HEPATITIS),
W. Lange, H. Koebler, and J. Apodaca. 15 May 70, 13p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) v215 p153-165 1970.

Descriptors: (*Hepatitis viruses, *Antigens + antibodies), Virus diseases, Infectious diseases, Serodiagnosis, West Germany.
Identifiers: Serum hepatitis, *Infectious hepatitis.

Out of 100 sera from patients with different infectious and noninfectious diseases 5 contained HAA (3 from patients with viral hepatitis, 1 from a patient with pancreatitis, 1 from a patient with gallbladder operation). Eighty out of 150 continuously tested patients (53.3%) contained HAA in their sera at different times after the onset of the disease. Twenty-three out of 150 patients with viral hepatitis had a possible serum hepatitis. In 38 cases (47.5% of the positive patients) HAA was demonstrable during the first 2-4 weeks after the onset of hepatitis, later on, during an investigational period of maximally 14 months it could no more be demonstrated. The sera of 10 children from a school epidemic were HAA negative. In 44 patients with HAA positive hepatitis antibodies to HAA could not be demonstrated. (Modified author abstract)

AD-768 957/3GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
PFLANZEN ALS NAEHRSUBSTRAT FUER CRYPTOCOCCUS NEOFORMANS (PLANTS AS A SUBSTRATUM FOR GROWTH OF CRYPTOCOCCUS NEOFORMANS),
F. Staib. 22 Apr 71, 11p
Text in German; attached abstract in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-218 p486-495 1971.

Descriptors: (*Yeasts, Plants(Botany)), (*Cryptococcus, *Plants(Botany)), Fungi, Growth, Culture media, West Germany.
Identifiers: *Cryptococcus neoformans, Taraxacum officinale.

The suitability of plants as a possible substratum for growth (in vitro) of C. neoformans has been investigated. A sample of hay collected from Wurzburg region and of stems and leaves of dandelion (Taraxacum officinale) were placed in test tubes. One lot of these was sterilized by autoclaving and the second left unsterile. The samples were inoculated by flooding them with suspensions prepared from two known strains of C. neoformans. The suspensions were decanted off and two ml of sterile distilled water were added to each of the inoculated test tubes which were incubated at 26C for one month and subsequently at room temperature. Discrete colonies of C. neoformans appeared after five days on samples of hay as well as of dandelion. They showed on dandelion a characteristic brown colour as described on niger-seed-(Guizotia abyssinica) medium, and their consistency varied with the strain of C. neoformans. Dry colonies of the fungus on infected plants were found to be still viable when tested after keeping for four years at room temperature, and these showed morphological and biochemical characteristics typical of the strains. (Modified author abstract)

AD-769 035/7GA Reprint
California Univ Berkeley Naval Biomedical Research Lab
SUSCEPTIBILITY OF MICE TO AIRBORNE KLEBSIELLA PNEUMONIAE' INFECTION IN HELIUM-OXYGEN ATMOSPHERES,
H. C. Ross, and W. D. Won. 1973, 4p
Sponsored in part by Office of Naval Research, Washington, D. C.
Availability: Pub. in Aerospace Medicine, p1009-1012 Sep 73.

Descriptors: (*Klebsiella, *Oxygen), (*Helium, Klebsiella), Diving, High-pressure research, Bacteria, Resistance(Biological), Infections.
Identifiers: Klebsiella pneumoniae, *Helium oxygen atmospheres, Hyperbaric atmospheres.

Currently, there is great interest shown in saturation diving and exploration of the continental shelf. The use of helium-oxygen gas mixtures for respiration and submerged habitat atmospheres is becoming routine. Helium appears to have few disadvantages when used as an atmospheric diluent, yet little is known of its effect upon host-microbial relationships. The present study was initiated to determine whether a hyperbaric helium-oxygen atmosphere would have an effect on host resistance or the pathogenicity of an existing bacterial upper respiratory infection. Klebsiella pneumoniae infections in mice were used as a model.

AD-769 038/1GA Reprint
Army Medical Research Inst of Infectious Diseases Frederick Md
SINDBIS VIRUS MATURATION,
C. E. Pedersen, Jr., and B. P. Sagik. 31 Aug 72, 6p
Availability: Pub. in Jnl. of General Virology, v18 p375-379 1973.

Descriptors: (*Arboviruses, Growth), Group A arboviruses, Viruses, Physiology, Electron microscopy.
Identifiers: *Sindbis virus, Glycoproteins.

Studies using the electron microscope showed that Sindbis virus could be labelled with ferritin-conjugated antibody only after maturation of the virus envelope. Host cell membranes did not bind antivirus globulins until virus nucleocapsids were immediately beneath them. Results suggest that either the incorporation into the cell membrane of the glycoprotein of the virus envelope is under the control of the progeny nucleocapsid or the progeny nucleocapsids are assembled adjacent to those portions of the membrane which have incorporated virus determined components.

COM-73-11621/2GA Reprint
Oregon State Univ., Corvallis. Dept. of Zoology.

'SPHAEROMYXA MAIYAI' SP. N. (PROTOZOA: MYXOSPORIDEA), COELOZOIC PARASITE OF THE PACIFIC TOMCOD, 'MICROGADUS PROXIMUS',
N. Donald Morrison, and Ivan Pratt. 1973, 6p
NOAA-73091904
Grant NOAA-043-158-4
Pub. in Jnl. of Protozoology, v20 n2 p214-217 1973.

Descriptors: (*Protozoa, *Cod), (*Parasites, Fishes), Marine fishes, Infections, Spores, Plasmodium, Invertebrates, Oregon.
Identifiers: Sphaeromyxa maiyai, Microgadus proximus, Sea Grant Program, Tomcod.

Sphaeromyxa maiyai sp. n. (Myxosporidea: Myxiidae) is described from the gall bladder of the Pacific tomcod Microgadus proximus Girard, from Newport, Oregon. The plasmodial stage is discoid averaging between 1 and 2 cm. The spore averages 27.6 x 5.6 micrometers in breadth, with pyriform polar capsules measuring 9.3 x 3.7 micrometers. Scanning electron microscopy reveals the presence of numerous longitudinal striations. (Author)

COM-73-11793/9GA Reprint
Oregon State Univ., Corvallis. Dept. of Food Science and Technology.
VOLATILE COMPOUNDS PRODUCED IN STERILE FISH MUSCLE ('SEBASTES MELANOPS') BY 'PSEUDOMONAS PUTREFACIENS', 'PSEUDOMONAS FLUORESCENS', AND AN 'ARCHROMOBACTER' SPECIES,
A. Miller, III, R. A. Scanlan, J. S. Lee, and L. M. Libbey. 19 Jan 73, 5p NOAA-73100302
Grant NOAA-043-158-4
Also pub. as Oregon State Univ., Corvallis. Agricultural Experiment Station, Technical Paper 3505.
Pub. in Applied Microbiology, v26 n1 p18-21 Jul 73.

Descriptors: (*Fishes, *Bacteria), (*Odors, Fishes), (*Pseudomonas, Fishes), (*Anaerobic processes, Proteins), Gas chromatography, Mass spectroscopy, Color, Texture, Food contamination, Eubacteriales, Thiols, Sulfides, Butanols, Amines.
Identifiers: Sea Grant program, Pseudomonas putrefaciens, Pseudomonas fluorescens, Achromobacter, Sebastes melanops, Trimethylamines, Rockfish, *Putrefaction.

Volatile compounds produced by Pseudomonas putrefaciens, Pseudomonas fluorescens, and an Achromobacter species in sterile fish muscle (Sebastes melanops) were identified by combined gas-liquid chromatography and mass spectrometry. Compounds produced by P. putrefaciens included methyl mercaptan, dimethyl disulfide, dimethyl trisulfide, 3-methyl-1-butanol, and trimethylamine. With the exception of dimethyl trisulfide, the same compounds were produced by an Achromobacter species. Methyl mercaptan and dimethyl disulfide were the major sulfur-containing compounds produced by P. fluorescens. (Author)

LBL-2015/GA PC$22.25/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
USE OF AROMATIC RESIDUES TO PROBE THE IRON--SULFUR CLUSTERS OF CLOSTRIDIUM ACIDI-URICI AND CLOSTRIDIUM PASTEURIANUM FERREDOXINS.
E. L. Packer. Jun 73, 401p
Contract W-7405-eng-48

Descriptors: (*Clostridium, *Biochemistry), (*Protons, *Redox potential), Amino acids, Binding energy, Carbon 13, Iron, Nuclear magnetic resonance, Sulfur.

For abstract, see NSA 28 07, number 17780.

N73-30064/2GA PC$3.00/MF$1.45
Public Health Service, Phoenix, Ariz. Environmental Microbiology Section.
SERVICES PROVIDED IN SUPPORT OF THE PLANETARY QUARANTINE REQUIREMENTS OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.
Technical Report, Apr. - Jun. 1973.
M. S. Favero. Jun 73, 9p NASA-CR-133742, REPT-42
NASA ORDER W-13062

Descriptors: *Spacecraft sterilization, *Unmanned spacecraft, Actinomycetes, Bacillus, Bacteria, Thermal resistance.

For abstract, see STAR 1121

N73-30068/3GA PC$3.00/MF$1.45
Techtran Corp., Silver Spring, Md.
THE AMMONIFYING ABILITY OF THE DENITRIFYING BACTERIA OF THE SPECIES PSEUDOMONAS FLUORESCENS.
Y. V. Kruglov. Sep 73, 9p NASA-TT-F-15086
Contract NASW-2485
Tran-Transl. Into English from TR. Vses. Nauch. Issld. Inst. Selskokhoz. Mikrobiol. (Moscow), V. 15, 1958 p 121-127.

Descriptors: *Ammonia, *Nitrates, *Pseudomonas, Carbon, Decomposition, Nutrition, Plants (Botany).

For abstract, see STAR 1121

N73-30346/3GA PC$3.50/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
SIMULATION OF THE ROLE OF MICRO-ORGANISMS DURING ORE FORMATION IN LAKES.
D. R. Gabe. Aug 73, 28p NASA-TT-F-15023
Contract NASW-2483
Tran-Transl. Into English from Izv. Akad. Nauk Sssr, Ser. Biol. (Ussr), No. 4, 1971 p 573-586.

Descriptors: *Iron ores, *Manganese compounds, *Microorganisms, Environment simulation, Geochemistry, Geophysics, Lakes, Oxidation.

For abstract, see STAR 1121

N73-30987/4GA PC$3.25/MF$1.45
Naval Biomedical Research Lab., Oakland, Calif.
RELEASE OF BACTERIAL SPORES FROM THE INNER WALLS OF A STAINLESS STEEL CUP SUBJECTED TO THERMAL STRESSES AND MECHANICAL SHOCK.
H. Wolochow, M. Chatigny, and J. Hebert. Apr 73, 24p NASA-CR-133868, NBRL-48TH-TPR
NASA ORDER W-13450

Descriptors: *Mars landing, *Mechanical shock, *Spacecraft contamination, *Spores, *Thermal stresses, Bacteria, Space exploration, Stainless steels.

For abstract, see STAR 1122

N73-30996/5GA PC$6.75/MF$1.45
Aerojet Medical and Biological Systems, El Monte, Calif.
TAPE CASSETTE BACTERIA DETECTION SYSTEM.
Final Report.
27 Apr 73, 93p NASA-CR-134035, REPT-1105-F
Contract NAS9-12548

Descriptors: *Bacteria, *Water treatment, *Weightlessness, Chemiluminescence, Life support systems, Sterilization, Water reclamation.

For abstract, see STAR 1122

PATENT-3 748 905/GA Not available NTIS
Becton, Dickinson and Co., Rutherford, N.J.
VACUUM PROBE SURFACE SAMPLER.
Patent.
B. A. Zahlava. Patented 31 Jul 73, 5p NASA-CASE-LAR-10623-1,
Misc-Filed 30 Dec. 1971 Supersedes N72-21415 (10 - 12, p 1608). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Microorganisms, *Samplers, *Vacuum apparatus, Patents, Portable equipment, Spacecraft contamination, Test equipment.

A vacuum probe surface sampler is described for rapidly sampling relatively large surface areas which possess relatively light loading densities of micro-organism, drug particles or the like. A vacuum head with a hollow handle connected to a suitable vacuum source is frictionally attached to a cone assembly terminating in a flared tip adapted to be passed over the surface to be sampled. A fine mesh screen carried by the vacuum head provides support for a membrane filter which collects the microorganisms or other particles. The head assembly is easily removed from the cone assembly without contacting the cone assembly with human hands.

PB-224 334/3GA PC$3.00/MF$1.45
Duke Univ., Durham, N.C.
THE RELATIONSHIP OF BLOOD TRANSFUSION TO CMV INFECTION AND DISEASE.
Annual progress rept. Jun 72-Sep 73,
David J. Lang, and Kwok-Sing Cheung. 30 Sep 73, 12p
Contract N01-HB-2-2910

Descriptors: (*Herpetic viruses, *Epidemiology), (*Blood transfusion, Herpetic viruses), (*Infectious diseases, Blood transfusion), Cultures(Biology), Leukocytes, Antibodies, Blood donors, Blood banks, Experimental data, Viral diseases, Viruses, Tests, Antigen antibody reactions, Laboratory animals, Serology.
Identifiers: *Cytomegalovirus, Complement fixation tests, Indirect hemagglutination tests, *Salivary gland virus.

Studies are underway of cytomegalovirus (CMV) growth in cells of lymphoid origin. Attempts are being made to reproduce in vitro the presumed CMV carrier state and to devise more sensitive and rapid means for virus detection. Methods of virus detection in vivo are being tested and, in this connection, the epidemiology of CMV infection and persistence is being defined. Immunologic methods have been improved and a quantitative test for CMV IgM antibody is under development. An hypothesis is proposed to explain the frequent transmission and activation of CMV in association with transfusion. This hypothesis is under test in vitro and in vivo, in clinical situations as well as in an animal model.

PB-224 336/8GA PC$3.00/MF$1.45
University Health Center of Pittsburg, Pa.
BLOOD TRANSFUSION AND CYTOMEGALOVIRUS INFECTION.
Annual rept. no. 1, 15 Jun-15 Sep 73,
Monto Ho, and John A. Armstrong. Oct 73, 14p
UHCP-73-CMV-1
Contract PHS-72-2912

Descriptors: (*Herpetic viruses, *Epidemiology), (*Blood transfusion, Herpetic), (*Infectious diseases, Blood transfusions), Viral diseases, Blood doners, Blood banks, Viruses, Experimental data, Surgery, Urine, Tests, Heart, Kidney, Pediatrics, Cultures(Biology), Antigen antibody reactions, Serology.
Identifiers: *Cytomegalovirus, Complement fixation tests, *Salivary gland virus.

The purpose of this study is to determine if cytomegalovirus (CMV) is transmitted from blood donors to blood recipients in the course of transfusion. Ninety pediatric patients undergoing open-heart surgery and 32 renal transplant recipients have entered our study and are being followed for evidence of CMV infection by culturing blood and urine for virus isolation and by serology. Eighteen percent (18%) of the former and forty-one percent (41%) of the latter group show evidence of post-surgical CMV infection. A study of CMV infection in immunosuppressed patients not receiving blood transfusions is underway and to date, three of eight show viruria.

PB-224 346/7GA PC$3.00/MF$1.45
Community Blood Center of Greater Kansas City, Mo.
THE EPIDEMIOLOGY OF CYTOMEGALOVIRUS AS TRANSMITTED BY BLOOD TRANSFUSION.
Annual rept. 1 Jun 72-30 Sep 73,
William L. Bayer, Gary E. Teatmeier, William C. Bell, and Gary R. Noble. Sep 73, 20p
Contract PHS-72-2909-B

Descriptors: (*Herpetic viruses, *Epidemiology), (*Blood transfusion, Herpetic viruses), (*Infectious diseases, Blood transfusion), Viral diseases, Blood donors, Blood banks, Serology, Surgery, Tissue culture, Viruses, Experimental data, Heart, Tests, Urine, Antigen antibody reactions.
Identifiers: *Cytomegalovirus, Indirect hemagglutination tests, Complement fixation tests, *Salivary gland virus.

During a 10-month period, 229 volunteer blood donors were examined at the time of donation for evidence of cytomegalovirus (CMV) infection by measurement of serum indirect hemagglutination antibody (IHA) and complement fixing (CF) antibody and culture of blood and urine on human embryonic tonsil fibro-blasts. The IHA and CF antibody prevalence was 59%. CMV was not isolated from leukocyte-rich plasma or washed leukocytes of any donor. Seven donors (3.1%) had asymptomatic cytomegaloviruria, but none had high antibody titers, a rise in titer, or CMV recovered from a second urine or blood culture. Three recipients of blood from donors with cytomegaloviruria were followed for 12 weeks. All developed a fourfold CMV antibody rise, one developed cytomegaloviruria, but none had atypical lymphocytosis or post-transfusion illness. Attempts to purify and biochemically characterize CMV strain AD169 are currently in progress.

PB-224 395/4GA PC$3.00/MF$1.45
Cleveland Metropolitan General Hospital, Ohio. Virus Lab.
EPIDEMIOLOGY AND DEVELOPMENT OF DETECTION SYSTEMS FOR CYTOMEGALOVIRUS AS TRANSMITTED BY BLOOD TRANSFUSION. (CMV TRANSMISSION BY BLOOD TRANSFUSION).
Interim progress rept. 1 Jun 72-31 Aug 73,
George A. Nankervis, and Eli Gold. 27 Sep 73, 14p
Contract PHS-72-2908-B

Descriptors: (*Herpetic viruses, *Epidemiology), (*Blood transfusion, Herpetic viruses), (*Infectious diseases, Blood transfusion), Viral diseases, Blood donors, Blood banks, Serology, Kidney, Surgery, Infants, Urine, Antigen-antibody reactions, Pregnancy, Surgical transplatation, Experimental data.
Identifiers: *Cytomegalovirus, Indirect hemagglutination tests, Immunoelectrophoresis, *Salivary gland virus.

The study is designed to ascertain the relative importance of intravenous transmission of cytomegalovirus (CMV) versus activation of latent infection, determine the incidence and severity of symptoms and evaluate parameters which might serve as screening methods for identification of patients with cytomegaloviremia. Infants undergoing exchange transfusion, patients receiving kidney transplants, and pregnant teenagers with CMV infection are being studied. Two of 16 infants followed for three months post exchange transfusion have remained well but have developed CMV infection, one with cytomegaloviremia and cytomegaloviruria and the other with cytomegaloviruria only. Both had antibody positive but non CMV excreting mothers and received blood from antibody positive, buffy coat negative donors. Five of 15 renal transplant recipients followed for three months have developed CMV infection including two with cytomegaloviremia. One of the latter developed fever and splenomegaly while the others have remained well. Seventeen of 96 (18%) pregnant teenagers had CMV infection on initial screening of urine, saliva, and buffy coat. Three of these had a positive buffy coat and all were asymptomatic. With currently available reagents it has not been possible to develop a screening method to identify patients with cytomegaloviremia.

UCLA-34-P-8-X-5/GA PC$3.00/MF$1.45
California Univ., Los Angeles.
STUDY OF PLANT VIRUS AS APPROACHED THROUGH THE STUDY OF NORMAL PLANT PROTEINS. PROGRESS REPORT, MAY 31, 1972--JUNE 1, 1973 AND FUTURE PLANS FOR 1973--1974.
S. G. Wildman. 1973, 13p
Contract AT(04-3)-34

Descriptors: (*Tobacco mosaic virus, *Growth), Biosynthesis, Chloroplasts, Electrophoresis, Leaves, Nicotiana, Phosphorus 32, Proteins, Ribosomes, Rna, Tracer techniques.

For abstract, see NSA 28 08, number 20654.

60. Pharmacology

AD-768 441/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
METHOD OF OBTAINING TETANIC ALLERGEN,
S. A. Shvarts, and E. N. Shlyakhov. 10 Oct 73, 5p
Rept no. FTD-HT-23-514-74
Edited trans. of Patent (USSR) 232 469 p1, 10 Apr 70, by Dean F. W. Koolbeck.

Descriptors: (*Clostridium tetani, *Antigens + antibodies), (*Centrifuge separation, Antigens + antibodies), USSR, Patents, Bacteria, Allergy, Diagnostic agents.
Identifiers: *Allergens, Translations.

A brief discussion is presented of an invention concerned with methods of obtaining tetanic allergen from killed bacterial cells. In contrast to existing methods, the proposed method involves centrifuging a culture of the tetanus bacillus on a liquid medium, washing it with a solution of table salt, autoclaving it, drying it, grinding it into a powder, and treating it with a liquid extractant, for example a solution of acetic acid. Such a procedure for obtaining the preparation makes it possible to increase its specificity.

AD-768 567/0GA Reprint
Florida Univ Gainesville Coll of Pharmacy
PHYSICAL AND CHEMICAL CHARACTERISTICS OF WATER-SOLUBLE, SEMISOLID, ANHYDROUS BASES FOR POSSIBLE OPHTHALMIC USE,
David W. Newton, Charles H. Becker, and George Torosian. 12 Apr 73, 6p
Contract DADA17-71-C-1041
Revision of report dated 5 Feb 73.
Availability: Pub. in Jnl. of Pharmaceutical Sciences, v62 n9 p1538-1542 Sep 73.

Descriptors: (*Ointments, *Polyethylene plastics), (*Ophthalmology, Ointments), Chemotherapeutic agents, Eye, Glycols, Solubility, pH, Viscosity.
Identifiers: *Polyoxyethylene.

Following a preliminary review of pertinent literature citations, a total of 84 semisolid, water-soluble, anhydrous bases for possible ophthalmic use was formulated. Of these 84 exploratory bases, five were designated evaluatory bases for further study on the basis of apparent pH and/or desirable physical spreadability characteristics over the temperature range of 0-50 degrees. Four of the five bases were further characterized by rotational viscometer studies, and an organogel was selected on the basis of several of its listed attributes as the best attempt in this investigation to formulate the type of semisolid base desired for possible ophthalmic use. (Author)

AD-768 866/6GA PC$3.50/MF$1.45
Little (Arthur D) Inc Cambridge Mass
DEVELOPMENT OF ANALYTICAL METHODS FOR THE DETERMINATION OF EXPERIMENTAL ANTIMALARIALS IN BIOLOGICAL FLUIDS.
Annual rept. Jul 72-Jun 73,
Alan W. Burg. 31 Aug 73, 60p Rept no. ADL-C-74862-5
Contract DADA17-72-C-2182

Descriptors: (*Antimalarials, Blood plasma), (*Blood plasma, Chemical analysis), Fluorescence, Experimental data, Chemotherapeutic agents, Gas chromatography, Drugs, Spectroscopy, Drugs.

Experimental work has been conducted to allow the development of analytical methods for the determination of antimalarial drugs in biological fluids. Both spectrofluorometric and gas chromatographic techniques have been applied to the analysis of WR 33063, WR 122455 and WR 171669 in human plasma. All developmental work has been based upon the potential utility of such methods to the clinical trial of new drugs. (Modified author abstract)

COO-3492-13/GA PC$3.00/MF$1.45
Rochester Univ., N. Y.
INVESTIGATION INTO THE PHARMACOLOGICAL PROPERTIES OF ANTI-IRRADIATION DRUGS. FINAL REPORT.
V. DiStefano. 1971, 16p
Contract AT(30-1)-3492

Descriptors: (*Aet, *Metabolism), (*Dmso, Metabolism), Biochemical reaction kinetics, Biological effects, Biosynthesis, Blood vessels, Catecholamines, Cats, Heart, Hydrolases, Mice, Organic bromine compounds, Organic sulfur compounds, Pathological changes, Radioprotective substances, Toxicity.

For abstract, see NSA 28 07, number 15734.

PB-224 574/4GA PC$4.50/MF$1.45
National Academy of Sciences-National Research Council, Washington, D.C. Div. of Medical Sciences.
DIMETHYL SULFOXIDE AS A THERAPEUTIC AGENT. REPORT OF THE AD HOC COMMITTEE.
Aug 73, 129p*
Contract FDA-70-22

Descriptors: (*Methyl sulfoxide, *Pharmacology), (*Toxicology, Methyl sulfoxide), Drugs, Eye, Humans, Skin, Drug therapy, Injuries, Pain, Rheumatoid arthritis, Cystitis.

Dimethyl sulfoxide (DMSO) produces side effects, particularly in the skin, in most persons treated, and there have been sporadic cases in which DMSO has been linked to acute generalized urticaria in man. There is also evidence that in some species of laboratory animals DMSO in doses somewhat higher than those contemplated for man produces a unique alteration of the lens. The nature of the evidence of effectiveness of

DMSO is not such as to warrant the release of the drug for prescription in general medical practice at this time. There is suggestive evidence that DMSO may be effective in the treatment of acute traumatic injury and nontraumatic painful shoulder and in relieving the pain of rheumatoid arthritis. Some investigators have claimed that DMSO may be superior to currently available forms of treatment in cutaneous scleroderma and in interstitial cystitis, but the evidence does not allow a conclusion to be drawn in that respect. As a vehicle, DMSO may enhance the effect of other therapeutic agents such as fungicides and antiviral agents. In view of the toxicity and lack of demonstrated efficacy in prior studies, the use of the drug should be restricted to investigational circumstances. Portions of this document are not fully legible.

6P. Physiology

AD-768 699/1GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
ELECTROPHYSIOLOGICAL INVESTIGATION OF DIFFERENT PARTS OF THE CAT'S AUDITORY SYSTEM UNDER CONDITIONS OF A SUSTAINED RYTHMICAL STIMULATION,
Ya. A. Altman. 7 Aug 73, 19p Rept no. FSTC-HT-23-1191-72
Trans. from Fiziologicheskii Zhurnal SSSR, v46 n5 1960.

Descriptors: (*Hearing, *Electrophysiology), Cerebral cortex, Ear, Auditory nerve, Vestibular apparatus, Stimulation, Sound, Cats, Experimental data, USSR.
Identifiers: Translations, Cochlea, Neurophysiology.

A statistically reliable drop in the amplitude of electrical responses of the cochlea, the internal geniculate body and the auditory zone of the cortex is noted during prolonged rhythmic stimulation of an animal that is awake. The response of the auditory zone of the cortex undergoes the greatest changes - a 35.4% reduction. The response of the internal geniculate body decreases by 30.5% and the neural component of the cochlea's response decreases by 23.8%. The microphonic component of the electrocutaneous algesic stimulation causes a restoration of electric response amplitudes to the original level. Analysis of experimental data indicate that decrease in electric response amplitudes takes place as a result of central influences that oppress the afferent impulse stream. Restoration of an electrical response amplitude after algesic stimulation is explained by excitation of the sympathetic nervous system and secretion of adrenalin.

AD-768 737/9GA PC$2.75/MF$1.45
Kobe Univ (Japan) Dept of Physiology (2nd)
STUDIES OF THE MAMMALIAN BRAIN FUNCTION IN VITRO.
Annual rept. no. 7, Dec 70-Dec 72,
Isamu Suda. Dec 72, 24p ARDG(EE)-J-293-7
Grant DA-CRD-AG-S92-544-67-G52

Descriptors: (*Brain, Freezing), (*Electrophysiology, Brain), In vitro analysis, Physiology, Central nervous system, Tissues(Biology), Cells(Biology), Storage, Viability, Histology, Glycerols.
Identifiers: Cryobiology, Cryoprotective agents.

Effects of long term (7 1/4 and 5 3/4 years) storage of the cat in frozen state at -20C in vitro after employing a glycerol perfusion technique were investigated from modes of neuroelectrical activity and histological evidences. The following conclusions were obtained: Glycerol, even if administered via vascular systems, showed cryoprotective effects on the brain tissues as was the case of single cells; it was possible to preserve viability of nervous tissues against many years storage in frozen state; reperfusion for revival brought about enlargement of micro-clefts in tissues which might have been produced by thawing of long term frozen tissues. This may be a cause of bleeding and activity defect in the revived brain; integrated neuroelectrical activity such as brain waves and evoked potentials may be affected significantly by dissolution of functions resulted from disruption in tissues; individual nerve cell activity, on the contrary, may be preserved well essentially or augmented in activity by degenerative processes. (Author)

AD-768 811/2GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
BIPHASIC OCCURRENCE OF IGM-FORMING CELLS IN THE INTESTINE AFTER ORAL IMMUNIZATION,
Hans-Juergen Werner, Hans LeFever, and Hansjuergen Raettig. 23 Nov 70, 4p
Revision of report dated 2 Sep 70.
Availability: Pub. in Nature, v232 n5306 p119-120, 9 Jul 71.

Descriptors: (*Vaccines, Ingestion(Physiology)), (*Gamma globulin, Cells(Biology)), (*Intestines, Gamma globulin), West Germany, Immunity.

The lamina propria has its own lymphatic organ with immunocompetent cells. The secretions of the mucous membranes contain, besides IgG and IgM, predominantly immunoglobulin IgA, which seems to be produced in the lymphatic part of the lamina propria and secreted into the intestinal lumen. Here the epithelial cells may play a special role by producing the so-called T piece that links 7S IgA to an 11S unit. Reported are IgM-producing cells which are demonstrable in the lamina propria by the direct Jerne technique and which occur biphasically after oral immunization.

AD-768 812/0GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
GRUNDLEGENDE UNTERSUCHUNG DES BELEGUNGSABLAUFES GENEIGTER OBERFLAECHEN MIT PARTIKELN, DARGESTELLT AM MODEL DER INDIREKTEN HAEMAGGLUTINATION NACH BOYDEN (BASIC STUDIES ON THE MECHANISM OF THE 'COATING' PROCESS ON INCLINED SURFACES USING INDIRECT HEMAGGLUTINATION (BOYDEN) AS A MODEL),
Heinz Pichl, Rolf Mosbach, and Rudolf Sonak. 11 Sep 70, 13p
Text in German.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) v217 p74-85 1971.

Descriptors: (*Antigen-antibody reactions, Scientific research), Serodiagnosis, Agglutinins, Antigens + antibodies, West Germany.
Identifiers: Hemagglutination.

Indirect hemagglutination is used as a model for studying the mechanism of 'coating' formed on an inclined surface. The extent of coating - B = B (r, cAK) - is shown to be a function of the locus (r) and the antibody concentration (cAK). It may be resolved into the product of two functions, one depending on r and the other on cAK. Hence r being constant, coating may be regarded as a measure of aggregation (hemagglutination) dependent on the antibody concentration. Coating in cuvettes arranged in an inclined position relative to gravitation is measured by means of a scanning technique. The equipment developed for this procedure is described. (Author)

AD-768 815/3GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
VERGLEICHENDE UNTERSUCHUNG DER INTESTINALANTIKEORPER NACH ORALER ODER INTRAPERITONEALER IMMUNISIERUNG VON NAEUSEN MIT HAMMELERYTHROZYTEN (COMPARATIVE INVESTIGATION ON INTESTINAL ANTIBODIES FOLLOWING ORAL OR INTRAPERITONEAL IMMUNIZATION OF MICE WITH SHEEP ERYTHROZYTES),
Hans Lefevre, Heinz Pichl, Hans-Juergen Werner, Andrea Wiener, and Adelgund Lissy. 19 Nov 70, 11p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) vA-217 p529-539 1971.

Descriptors: (*Antigen-antibody reactions, Intestines), Immunity, Injection(Medicine), Ingestion(Physiology), Antigens + antibodies, Erythrocytes, Mammals, West Germany.
Identifiers: Sheep.

The secretion of antibodies into the gut following oral and intraperitoneal immunization was comparatively investigated. After oral as well as intraperitoneal immunization of mice with sheep red cells (SE) we found agglutinating antibodies of the 7S and 11S type in the gut secret. After intravenous injection (passive immunization) of anti-SE-gammaglobulin only low quantities of antibodies secreted out of the serum in the gut. Active intraperitoneal immunization resulted in higher antibody titers in the secret than immunization with threefold quantities of antigen. The effect of local administration of antigen upon immune reaction of the mucouse membranes is discussed. It is suggested that intraperitoneal as well as oral antigen application represent local forms of immunization for the lamina propria of the gastrointestinal-tract. (Modified author abstract)

AD-768 942/5GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
DIE WIRKUNG LINEARER POLYMERE AUF DIE AGGREGATION VON PROTEINBELADENEN ERYTHROZYTEN GEMESSEN ALS BELEGUNG GENEIGTER OBERFLAECHEN (THE INFLUENCE OF LINEAR POLYMERS ON THE AGGREGATION OF PROTEIN-CONJUGATED ERYTHROCYTES MEASURED AS 'COATING' ON INCLINED SURFACES),
Rolf Mosbach, Heinz Pichl, and Rudolf Sonak. 11 Sep 70, 11p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) v217 p86-95 1971.

Descriptors: (*Antigen-antibody reactions, Proteins(Conjugated)), Antigens + antibodies, Erythrocytes, Polymers, Ethylenes, Glycols, West Germany, Serodiagnosis.
Identifiers: Hemagglutination.

The influence of linear polymers such as polyethylene glycol (PEG) on the aggregation of protein-conjugated erythrocytes is studied. Aggregation is measured as the extent of 'coating' (B) formed on inclined surfaces. Aggregation curves with PEG 6000 as a function of the PEG concentration are shown for tanned, humanserumalbumin-conjugated, human gammaglobulin-conjugated, and native erythrocytes. (Author)

AD-768 956/5GA Not available NTIS
Robert Koch-Institut Berlin (West Germany)
UEBER DIE DIAPLACENTARE UEBERTRAGUNG VON KOMPLEMENTBINDENDEN ANTIKOERPERN GEGEN DAS CYTOMEGALIEVIRUS (ON THE PLACENTAL TRANSMISSION OF CYTOMEGALOVIRUS CF-ANTIBODIES),
Grigorios Antoniadis, and Helga Jordanski. 12 Oct 70, 8p
Text in German; attached summary in English.
Availability: Pub. in Zentralblatt fuer Bakteriologie Hygiene. I. Abt. Originale (West Germany) v216 p428-434 1971.

Descriptors: (*Herpetic viruses, Antigens + antibodies), (*Antigens + antibodies, *Placenta),

Viruses, Adults, Infants, Gamma globulin, Immunity, West Germany.
Identifiers: *Cytomegaloviruses, *Salivary gland virus, Complement fixation.

One hundred fifteen paired sera from normal mothers (venous blood) and their newborn infants (umbilical cord blood) were examined for CF-antibodies against the Cytomegalovirus strain C-87. The results show that 49% of the mothers on the day of delivery possessed antibodies against cytomegalovirus with titres between 1:4 and 1:64. These antibodies were transferred to the newborn, either in identical (70% of the positive cases) or in higher (27%) and only in 3% in lower levels than in the corresponding maternal blood. These findings suggest that the maternal Cytomegalovirus CF-antibodies are not only subject to passive placental transfer but in approximately one third of the positive cases an active placental transport resulting in an elevated antibody concentration in the newborn occurs. (Modified author abstract)

AD-769 878/7GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
PROSPECTIVE MATERNAL NUTRITION STUDY IN TAIWAN: RATIONALE, STUDY DESIGN, FEASIBILITY, AND PRELIMINARY FINDINGS,
R. Quentin Blackwell, B. F. Chow, Kenneth S. K. Chinn, Boon-Nam Blackwell, and S. C. Hsu. 1973, 12p Rept no. NAMRU-2-TR-565
Availability: Pub. in Nutrition Reports International, v7 n5 p517-532 May 73.

Descriptors: (*Nutrition, *Pregnancy), Diet, Proteins, Minerals, Vitamins, Calorimetry, Infants, Body weight, Taiwan.

Since January 1967, a controlled prospective double-blind study has been in progress in Taiwan to determine possible effects of maternal dietary supplementation during pregnancy and lactation upon growth and development of the offspring. Mothers studied had marginal diets with daily protein intakes (primarily of vegetable origin) not exceeding 40 grams and energy intakes of approximately 2,000 KCal. One of two liquid supplements was taken daily by each mother; each supplement was permanently assigned to one-half the mothers in a random double-blind design. Supplement A provided 40 grams of milk protein and 800 KCal daily plus vitamins and minerals; Supplement B supplied only vitamins and minerals. Each mother completing the study had two study infants; one born before and one after supplementation. Observations on babies include birth weights and lengths, periodic anthropometric measurements, nitrogen balances (males), and Bailey tests for mental and motor development. Placentae also were collected for weight determination and chemical analysis. Preliminary evaluation of birth weights (BW) and lengths (BL) indicates a small increment in BW and BL in males but not in females from mothers receiving protein-calorie supplementation (PCS). Placental weights were unaffected by PCS. Mothers receiving PCS had fewer infants with BW below 2500 grams. (Modified author abstract)

AD-769 884/3GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
POSSIBLE IMPROVEMENT IN QUALITY OF HUMAN PROGENY BY MATERNAL DIETARY INTERVENTION: IMPLICATIONS FOR PROGRAMS OF FAMILY PLANNING AND FOOD PRODUCTION,
S. C. Hsu. May 73, 12p Rept no. NAMRU-2-TR-566
Availability: Pub. in Nutrition Reports International, v7 n5 p569-583 May 73.

Descriptors: (*Nutrition, *Pregnancy), (*Birth, Control), (*Food, Production), Public health, Medical research, Taiwan, Sociology, Economics, Mortality rates.
Identifiers: *Family planning.

Family planning programs which seek simultaneously to lower birth rates while improving maternal and child health should be cognizant of programs for increasing food production and improving its utilization. Limitation of number of offspring is only one part of the family planning strategy. Other important parts include reduction in morbidity and mortality of mothers and infants and production of offspring which are normal, healthy, alert, and intelligent. Nutrition is one of several areas requiring attention. The central question is one of priorities: which phase needs greatest emphasis to improve quality of offspring by improvement of nutrition. Must improvement be sought in one or all phases of maternal diet, including pre-pregnancy, pregnancy and lactation period, or does research have to concentrate on the infant after birth. (Modified author abstract)

COM-73-11823/4GA Reprint
National Marine Fisheries Service, Seattle, Wash.
TWO MOLECULAR SPECIES OF AGGLUTININS IN RAINBOW TROUT ('SALMO GAIRDNERI') SERUM AND THEIR RELATION TO ANTIGENIC EXPOSURE,
H. O. Hodgins, F. L. Wendling, B. A. Bratten, and R. S. Weiser. 14 Nov 72, 4p NOAA-73092510
Prepared in cooperation with Washington Univ., Seattle. Dept. of Microbiology.
Pub. in Comparative Biochemistry and Physiology, v45B p975-977 1973.

Descriptors: (*Agglutinins, *Trout), (*Immunology, Fishes), Bacteria, Antigen antibody reactions, Fresh water fishes, Immunology, Erythrocytes, Rabbits.
Identifiers: Rainbow trout, Salmo gairdnerii, Chrondrococcus columnaris.

Both large-molecule and small-molecule agglutinins have been found in rainbow trout serum. Only the large-molecule agglutinin was induced by exposure to antigen. Rainbow trout were exposed to a living, attenuated strain of the fish pathogen Chondrococcus columnaris and to rabbit erythrocytes. The fish used did not possess detectable natural agglutinins for the bacterium, but had natural agglutinin titers of 1 : 8 to 1 : 32 for rabbit erythrocytes and natural hemolysin titers of 1 : 100 for rabbit erythrocytes. It has been clearly demonstrated by the present and previous work that normal trout serum contains a small molecular species of specific natural agglutinin that is distinct from a larger molecular weight agglutinin induced by several soluble and particulate antigens.

CONF-730633-1/GA PC$3.25/MF$1.45
Oak Ridge National Lab., Tenn.
MEGAKARYOCYTOPOIESIS AND ITS RESPONSE TO STIMULATION AND SUPPRESSION.
T. T. Jr. Odell. 1971, 21p

Descriptors: (*Blood platelets, *Blood formation), Bone marrow cells, Cell cycle, Mitotic index, Ploidy, Populations, Stem cells, Thymidine, Tracer techniques, Tritium.

For abstract, see NSA 28 07, number 17739.

CONF-730644-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
POSITION PAPER: MULTICOMPONENT ANALYSIS.
N. G. Anderson. 10p

Descriptors: (*Man, *Metabolism), (*Neoplasms, *Genes), Anatomy, Biochemistry, Enzymes, Proteins.

For abstract, see NSA 28 07, number 17742.

JPRS-60186/GA PC$3.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
PHYSIOLOGICAL STUDIES ON THE COMPLEX BEHAVIOR OF ANTHROPOIDS (CHIMPANZEES),
A. I. Schastnyi. 2 Oct 73, 32p
Trans. of Uspekhi Fiziologicheskikh Nauk (USSR) n3 p46-68 1973.

Descriptors: (*Chimpanzees, *Physiology), Conditioned responses, Primates, Animal physiology, Animal behavior, Reflexes, Central nervous system, Physiological psychology, USSR, Translations.
Identifiers: Neurophysiology.

The report contains the current status of physiological research on the comlex pattern of 'voluntary' behavior of chimpanzees. The use of special methods made it possible to trace the formation and development of this kind of anthropoid activity and thereby simulate various critical situations and optimal ranges of mediated behavioral acts, including those made with signs and communication devices. The experimental data on the 'voluntary' activity of anthropoids are analyzed in the light of the reflex theory of physiological mechanisms.

N73-30072/5GA PC$4.75/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bad Godesberg (West Germany). Inst. fuer Flugmedizin.
BEHAVIOR OF CELL ENZYMES, GLUCOSE, CHOLESTEROL, AND 17-HYDROXYCORTICOSTEROIDS IN BLOOD DURING PHYSICAL EXERCISE AND AS A FUNCTION OF TRAINING CONDITION DAS VERHALTEN VON ZELLENZYMEN, GLUCOSE, CHOLESTERIN UND 17-HYDROXY-CORTICOSTEROIDEN IM BLUT UNTER KOERPERLICHER ARBEIT IN ABHAENGIGKEIT VOM TRAININGSZUSTAND.
Ph.D. Thesis - Bonn Univ.
G. Brockkoetter. 17 Jul 72, 55p DLR-FB-72-48
In German; English Summary.

Descriptors: *Enzyme activity, *Hemodynamic responses, *Physical fitness, *Physical work, *Physiological responses, Cholesterol, Education, Glucose, Hydroxycorticosteroid, Oxygen consumption.

For abstract, see STAR 1121

N73-30998/1GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
FUNCTIONAL TEST WITH A WATER LOAD.
Sep 73, 4p NASA-TT-F-15091
Contract NASW-2481
Tran-Transl. Into English of the Publ. "Funktionalnaya Proba S Vodnoy Nagruzkov" Moscow, Acad. Of Sci., 1973 3 p.

Descriptors: *Adrenal metabolism, *Clinical medicine, *Hydration, *Kidneys, *Water consumption, Hemodynamic responses, Physiological effects, Postflight analysis, Urinalysis.

For abstract, see STAR 1122

N73-30999/9GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
STUDY OF IMMUNOLOGICAL REACTIVITY.
Sep 73, 7p NASA-TT-F-15089
Contract NASW-2481
Tran-Transl. Into English of Rept. "Issled. Immunol. Reaktivnosti" Moscow, Acad. Sci. Ussr, 1973 6 p.

Descriptors: *Immunology, *Lymphocytes, *Peripheral circulation, *Physiological responses, Blood circulation, Earth environment, Space flight.

For abstract, see STAR 1122

PB-224 122/2GA PC$3.75/MF$1.45
Federation of American Societies for Experimental Biology, Bethesda, Md.
THE BIOAVAILABILITY OF IRON SOURCES AND THEIR UTILIZATION IN FOOD ENRICHMENT.
Technical rept.,
James Waddell. Aug 73, 86p*
Contract FDA-71-294

Descriptors: (*Iron, Metabolism), (*Food additives, Iron), (*Absorption(Biology), Iron), (*Nutrition, Iron), Nutritive value, Nutritional requirements, Trace elements, Iron sulfate, Iron inorganic compounds.

The report reviews the program of iron enrichment of foods and assesses the suitability of the different iron compounds from the standpoint of the bioavailability of the form of iron used and the effects of the iron coumpounds on foods. The report reviews the development of knowledge of iron metabolism over the last century; methods of measuring absorption of iron from the digestive tract; and human and animal research pertinent to assessment of the iron enrichment of foods. Tests on animals and man have shown that the soluble iron salts, preferable the ferrous valence, are most absorbable. Among the iron sources used in the fortification of foods, ferrous sulfate exhibits the greatest bioavailability. On the basis of this property it is iminently suitable and it is the enriching agent of choice; however, in its present commercial form, it is incompatible with storage stability and functional properties of certain food products. Therefore, other iron compounds of lesser bioavailability have been substituted. These latter substances have been finely divided iron powders, and the insoluble ferric orthophosphate and sodium iron pyrophosphate. The crux of the enrichment problem is the decision of how much bioavailability may be sacrificed to obtain product stability.

PB-224 503/3GA PC$4.25/MF$1.45
Hazleton Labs., Inc., Vienna, Va.
PHYSIOLOGY STUDY OF CYNOMOLGUS MONKEYS.
Final rept. Jul 72-Jun 73,
William B. Coate. 22 Aug 73, 115p NIH/NHLI-72-2941-12
Contract PHS-72-2941

Descriptors: (*Tobacco, *Smoking), (*Physiological effects, Smoking), (*Lungs, Smoking), Laboratory animals, Monkeys, Respiratory diseases, Trachea, Morphology, Experimental data, Hematology, Blood pressure, Histology, Animal physiology, Blood chemical analysis.
Identifiers: *Cigarette smoking.

Three groups of four male cynomolgus monkeys were forced to smoke either 10, 20, or 40 cigarettes per day, six days a week for 13 weeks. A fourth group sham smoked 40 cigarettes, while a fifth group was left untreated in their cages. A battery of tests was employed to evaluate the animals' pulmonary function. Measurements of tracheal clearance rates, tracheal microflora, and hematology and serum chemistry parameters were examined. At termination, lung morphometry was performed. No physiological and no morphological effects of smoking were seen after 13 weeks. A chronic smoking study, as well as a 26-week study, is in progress.

RT/BIO-(72)50/GA PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
IMMUNOCYTE INTERACTIONS IN VITRO.
G. Doria, G. Agarossi, and S. Di Pietro. 1971, 9p
U.S. Sales Only.

Descriptors: (*Thymocytes, *Immune reactions), (*Bone marrow cells, Immune reactions), Erythrocytes, Immunity, In vitro.

For abstract, see NSA 28 08, number 20638.

UR-3490-291/GA PC$3.50/MF$1.45
Rochester Univ., N. Y. Dept. Of Radiation Biology and Biophysics.
STRUCTURE AND FUNCTION OF THE RED CELL MEMBRANE: CHANGES DURING STORAGE.
R. I. Weed, P. L. LaCelle, and M. Udkow. 1973, 28p CONF-730549-1

Descriptors: (*Cell membranes, *Molecular structure), (*Erythrocytes, Cell membranes), Atp, Biological models, Hemoglobin, Storage.

For abstract, see NSA 28 07, number 17827.

6Q. Protective Equipment

CEA-N-1617/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
TESTS ON PRESSURIZED CLOTHING FOR WORK IN ENVIRONMENTS HIGHLY CONTAMINATED WITH TRITIUM.
Y. Le Bourdonnec, P. Colonna, and R. Renard. May 73, 9p
In French. U.S. Sales Only.

Descriptors: (*Protective clothing, *Performance testing), (*Tritium, Protective clothing), Contamination, Radiation protection.

For abstract, see NSA 28 07, number 15461.

N73-31014/6GA PC$4.25/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
THE PROTECTIVE PERFORMANCE OF CRASH HELMETS.
S. R. Sarrailue. Mar 73, 41p ARL/SM-NOTE-390

Descriptors: *Aircraft pilots, *Helmets, *Impact resistance, *Safety devices, Agriculture, Aircraft accidents, Crash injuries, Utility aircraft.

For abstract, see STAR 1122

PATENT-3 535 246/GA Not available NTIS
Department of the Navy Washington D C
HEAT PRODUCING COMPOSITION AND METHOD OF EMPLOYMENT.
Patent,
Charles J. Crowell, Jr. Filed 21 Mar 68, patented 20 Oct 70, 2p Rept nos. PAT-APPL-714 779,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Heaters, *Underwater clothing), (*Patents, Heaters), Lithium alloys, Magnesium alloys, Aluminum alloys, Acetic anhydrides, Sulfates, Aluminum compounds, Ammonium compounds, Compatibility, Colloids.
Identifiers: PAT-CL-252-70, *Exothermic reactions, Ammonium sulfate, Aluminum sulfate.

The invention describes a non-toxic cream having a specified chemical component which reacts exothermally upon the addition of water to provide heat for warming inanimate articles or living bodies subject to a cold environment such as immersion in water and the like. The chemical heat generating component includes alloys of lithium and aluminum, lithium and magnesium, aluminum and magnesium or powdered magnesium. The cream is spread directly upon the object to be warmed where environmental water initiates the warming reaction or the cream may be placed within a protective suit such as that worn by a diver or flyer with water admitted in controlled amounts to create the heat producing exothermic reaction.

PATENT-3 548 411/GA Not available NTIS
Department of the Navy Washington D C
RETRACTABLE GOGGLES FOR HELMET.
Patent,
Frederick E. Barstow, Paul Larson, and Udo W. Salomon. Filed 26 Feb 69, patented 22 Dec 70, 5p Rept nos. PAT-APPL-802 524,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Eyeglasses, *Patents), (*Helmets, Eyeglasses), Protective mask facepieces, Pilots, Flashblindness.
Identifiers: PAT-CL-2-6.

The invention relates to protective helmets such as worn by aircraft pilots, and more particularly to flashblindness-protective retractable goggles having a relatively large field of view.

6R. Radiobiology

AD-768 642/1GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Biological Sciences
THE INFLUENCE OF GAMMA-RADIATION ON THE STRUCTURE AND BIOLOGICAL ACTIVITY OF OXYTOCIN, A CYCLIC OLIGOPEPTIDE,
J. W. Purdie, and K. R. Lynn. 17 Nov 72, 7p Rept no. NRC-13064 DREO-670
Revision of report dated 21 Sep 72. Summary in French.
Availability: Pub. in International Jnl. of Radiation Biology and Related Studies in Physics, Chemistry and Medicine, v23 n6 p583-589 1973.

Descriptors: (*Pituitary hormones, *Gamma rays), (*Radiation effects, Pituitary hormones), Hormones, Attenuation, Radiological dosage, Canada.
Identifiers: Cystine, Tyrosine.

During irradiation in aqueous solution under various conditions, the biological activity of oxytocin was lost exponentially, and the following D37 doses were found: aerated, 270 krads; deaerated, 230 krads; N2O saturated, 170 krads; deaerated + butanol, 440 krads. Thus, the hydroxyl radical appeared to be the principal inactivating species. Hydrolysis and analysis of irradiated hormone showed that cystine and tyrosine were the main residues affected. Irradiated oxytocin was resolved into three fractions by gel filtration of Sephadex G-15: The first fraction, which was inactive, predominated in deaerated solution and appeared to consist of dimer or polymer. The third fraction was the major one from aerated and N2O-saturated solutions and had a potency close to that of the original hormone. (Author)

AD-768 753/6GA PC$3.00/MF$1.45
Naval Ordnance Lab White Oak Md
A COMPUTERIZED RADIATION DOSIMETRY RECORDING SYSTEM,
Richard P. Marquiss. 8 Aug 73, 50p Rept no. NOLTR-73-145

Descriptors: (*Dosimeters, Digital recording systems), (*Computer programs, Instruction manuals), Radiation hazards, Radiation monitors.
Identifiers: DOSE computer program.

The maintenance of accurate and timely dosimetry records is one of the perpetual problems that plague the health physicist. Fortunately the modern digital computer is ideally suited to perform this task. Once properly programed the computer will perform this task at a minimum cost and without the frequent computational errors to bother the human record keeper. One example of a method of keeping the required records through computerization is presented. (Author)

AD-768 921/9GA PC$2.75/MF$1.45
Lovelace Foundation for Medical Education and Research Albuquerque N Mex
BARORECEPTOR REFLEX RESPONSE TO PHENYLEPHRINE AND CAROTID OCCLU-

SION IN MONKEYS RECEIVING 1000 RADS COBALT-60.
Topical rept.,
Alfred Bruner, A. William Neely, Ernest A. Henderson, and Gerald K. Weiss. 10 Aug 73, 25p
DNA-3161T
Contract DASA01-70-C-0059

Descriptors: (*Radiation tolerance, Monkeys), (*Obstruction(Physiology), Reflexes), Cobalt, Dose rate, Aromatic compounds, Radiobiology.
Identifiers: Phenylesphrine.

Nine conscious monkeys received phenylephrine and carotid occlusion test of baroreflex function before and after 1000 rads Cobalt-60 exposure (dose rate = 170 rads/min.). During the early postradiation minutes, concomitantly with hypotension and tachycardia, both baroreflex tests revealed depressed sensitivity (diminished blood pressure and heart rate changes). After 8-15 minutes postradiation, the phenylephrine, but not the occlusion test demonstrated a reversal to significant baroreceptor hypersensitivity which persisted 24 hours or more. No failure of the baroreflex mechanisms was suggested. (Author)

AECL-4220/GA PC$5.25/MF$1.45
Atomic Energy of Canada LTD., Pinawa (Manitoba). Whiteshell Nuclear Research Establishment.
EFFECTS OF CHRONIC INGESTION OF ORGANIC REACTOR COOLANT (HB-40) ON MICE (MUS MUSCULUS). PART I.
S. L. Iverson, and B. N. Turner. Jun 73, 63p
U.S. Sales Only.

Descriptors: (*Mice, *Biological radiation effects), (*Terphenyls, *Radiosensitivity effects), Coolants, Drinking water, Ingestion, Lethal radiation dose, Litter size, Photon beams, Reactors, Response modifying factors, Toxicity, X radiation.

For abstract, see NSA 28 08, number 18510.

ANU-P-576/GA PC$3.00/MF$1.45
Australian National Univ., Canberra. Research School of Physical Sciences.
RADIATION AND FALLOUT.
E. W. Titterton. 8p
U.S. Sales Only.

Descriptors: (*Human populations, *Radiation doses), (*Australia, *Fallout), Background radiation, Biological radiation effects, Biomedical radiography, Comparative evaluations, Environment, Nuclear explosions, Radiation hazards, Radioactivity, X radiation.

For abstract, see NSA 28 08, number 18460.

AWTSC-4/GA PC$4.25/MF$1.45
Atomic Weapons Tests Safety Committee, Victoria (Australia).
STRONTIUM-90 AND CAESIUM-137 IN THE AUSTRALIAN ENVIRONMENT DURING 1970 AND SOME RESULTS FOR 1971.
Sep 72, 45p
U.S. Sales Only.

Descriptors: (*Human populations, *Radiation hazards), (*Strontium 90, *Biological radiation effects), (*Cesium 137, Biological radiation effects), (*Australia, *Fallout), Diffusion, Environment, Genetic radiation effects, Internal irradiation, Man, Nuclear explosions, Radiation doses, Radiation monitoring, Radionuclide migration, Uptake.

For abstract, see NSA 28 08, number 18533.

AWTSC-5/GA PC$3.25/MF$1.45
Atomic Weapons Tests Safety Committee, Victoria (Australia).
FALLOUT OVER AUSTRALIA FROM NUCLEAR WEAPONS TESTED BY FRANCE IN POLYNESIA DURING JUNE AND JULY 1972.
Oct 72, 25p
U.S. Sales Only.

Descriptors: (*Australia, *Fallout), (*Human populations, *Radiation hazards), (*Iodine 131, *Radiation monitoring), (*Thyroid, *Radiation doses), Beta sources, Environment, Fission products, Man, Nuclear explosions, Radioactivity, Gamma sources, Whole-body counting, Food chains, Internal irradiation, Milk, Radionuclide migration, Retention, Scintiscanning, Uptake.

For abstract, see NSA 28 08, number 18534.

BNL-17966/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
USE OF DIFFUSION CHAMBER CULTURES IN THE STUDY OF NORMAL AND LEUKEMIC CELL PROLIFERATION IN MAN.
E. P. Cronkite, W. Boecker, A. L. Carsten, G. Chikkappa, and D. Joel. 1973, 16p CONF-730548-1

Descriptors: (*Bone marrow cells, *Biological radiation effects), (*Neutrophils, Biological radiation effects), (*Erythrocytes, Biological radiation effects), (*Macrophages, Biological radiation effects), Autoradiography, Blood formation, Blood platelets, Cell cultures, Cell proliferation, Cfu, Goats, Growth, Mice, Radiations, Thymidine, Tritium.

For abstract, see NSA 28 07, number 15685.

BNL-17967/GA PC$3.25/MF$1.45
Brookhaven National Lab., Upton, N. Y.
EFFECTS OF IONIZING RADIATION ON HEMOPOIESIS.
E. P. Cronkite. 1973, 21p CONF-730637-1

Descriptors: (*Man, *Biological radiation effects), (*Hematopoietic system, *Radiosensitivity), (*Radiation syndrome, *Etiology), (*Leukemogenesis, *Dose-response relationships), Animal cells, Blood cells, Bone marrow cells, Human populations, Ionizing radiations, Personnel, Radiation dose distributions, Radiation hazards, Response modifying factors, Stem cells.

For abstract, see NSA 28 08, number 18461.

BNL-17987/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
DIFFUSION CHAMBER TECHNIC AS PROGENITOR (STEM) CELL ASSAY.
A. Boeyum, E. O. Pettersen, B. Laane, and A. L. Carsten. 1973, 15p CONF-730548-2

Descriptors: (*Stem cells, *Bioassay), (*Hematopoietic system, *Biological radiation effects), Endoxan, Hydroxy compounds, Mice, Photon beams, Spleen, Urea, X radiation.

For abstract, see NSA 28 08, number 18511.

BNWL-SA-4724/GA PC$4.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
EVALUATIONS OF INTAKE AND DEPOSITION BASED ON BIOASSAY DATA.
K. R. Heid. 1973, 36p CONF-730603-8

Descriptors: (*Radioisotopes, *Intake), (*Man, *Radiation doses), (*Plutonium isotopes, *Retention), (*Americium, Retention), Bioassay, Dose commitments, Organs, Radionuclide kinetics, Clearance, Excretion, Exhalation, Inhalation, Urine, Curium, Sampling, Uranium, Tritium.

For abstract, see NSA 28 07, number 15770.

BNWL-1183-15/GA PC$3.25/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
MEASUREMENT OF RADIATION EXPOSURE OF ASTRONAUTS BY RADIOCHEMICAL TECHNIQUES. QUARTERLY RESEARCH REPORT TO THE NASA MANNED SPACECRAFT CENTER, APRIL 2, 1973–JUNE 30, 1973.
R. L. Brodzinski. 15 Jul 73, 22p
Contract AT(45-1)-1830

Descriptors: (*Urine, *Activation analysis), (*Sodium, Activation analysis), (*Potassium, Activation analysis), (*Rubidium, Activation analysis), Antimony 124, Apollo project, Astronauts, Cesium 137, Chemical analysis, Chromium 51, Cobalt 60, Cosmic radiation, Injection, Iron 59, Potassium 42, Radiation doses, Radiochemical analysis, Sodium 24, Antimony, Arsenic, Barium, Bromine, Cadmium, Calcium, Cesium, Chromium, Cobalt, Europium, Gold, Hafnium, Iron, Lanthanum, Mercury, Multi-element analysis, Neutron beams, Quantitative chemical analysis, Samarium, Scandium, Selenium, Silver, Strontium, Tantalum, Terbium, Thorium, Tin, Zinc.

For abstract, see NSA 28 08, number 18462.

BNWL-1750(Pt.1)/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1972 TO THE USAEC DIVISION OF BIOLOGICAL AND ENVIRONMENTAL RESEARCH. VOLUME I. LIFE SCIENCES. PART I. BIOLOGICAL SCIENCES.
R. C. Thompson. Apr 73, 113p
Contract AT(45-1)-1830

Descriptors: (*Biology, *Research programs), Leading abstract.

For abstract, see NSA 28 07, number 15678.

CEA-N-1587/GA PC$3.25/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
SPECTRAL DISTRIBUTIONS OF COBALT THERAPY UNITS.
J. Legrand, and J. Morel. Feb 73, 24p
In French. U.S. Sales Only.

Descriptors: (*Radiotherapy, *Gamma spectra), Cobalt 60, Gamma sources, Scattering.

For abstract, see NSA 28 07, number 15667.

CONF-720505-/GA PC$13.60/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
RADIONUCLIDE CARCINOGENESIS. PROCEEDINGS OF THE TWELFTH ANNUAL HANFORD BIOLOGY SYMPOSIUM, MAY 10–12, 1972. AEC SYMPOSIUM SERIES.
C. L. Sanders, R. H. Busch, J. E. Ballou, and D. D. Mahlum. Jun 73, 506p

Descriptors: (*Radioisotopes, *Biological radiation effects), (*Carcinogenesis, *Radioinduction), Biological radiation effects, Internal irradiation, Leading abstract, Mammals, Meetings, Neoplasms, Proceedings.

For abstract, see NSA 28 08, number 18547.

CONF-730550-1/GA PC$3.00/MF$1.45
Australian Academy of Science, Canberra.
REPORT OF THE AUSTRALIAN SCIENTISTS.
1973, 5p
U.S. Sales Only.

Descriptors: (*Human populations, *Genetic radiation effects), (*Australia, Fallout), (*Radiation hazards, Fallout), (*Fallout, *Biological radiation effects), Bone marrow cells, Bone tissues, Carbon 14, Cesium 137, Comparative evaluations, Dose commitments, Dose limits, Iodine 131, Leukemia, Meetings, Meteorology,

Nuclear explosions, Radiation doses, Strontium 91, Thyroid, Whole-body irradiation.

For abstract, see NSA 28 08, number 18464.

CONF-730814-1/GA PC$3.50/MF$1.45
Oak Ridge National Lab., Tenn.
PHYSICAL DOSIMETRY INVOLVED IN MAKING DOSE ESTIMATES FOR POPULATION EXPOSURES.
W. S. Snyder. 1973, 28p

Descriptors: (*Infants, *Radiation doses), (*Children, Radiation doses), (*Internal irradiation, *Dosimetry), Dose rates, Human populations, Radiation dose distributions, Radioisotopes, Radionuclide kinetics, Retention, Uptake.

For abstract, see NSA 28 08, number 18543.

CONF-730907-2/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
TABULATION OF SPECIFIC EFFECTIVE ENERGIES FOR DOSE CALCULATIONS.
M. R. Ford, and W. S. Snyder. 1972, 10p

Descriptors: (*Internal irradiation, *Spatial dose distributions), (*Organs, Spatial dose distributions), Alpha particles, Beta particles, Bone marrow, Bone tissues, Monte carlo method, Photons, Recoils.

For abstract, see NSA 28 08, number 20135.

COO-1787-17/GA PC$6.25/MF$1.45
Colorado State Univ., Fort Collins. Dept. Of Radiology and Radiation Biology.
LYMPH TRANSPORT OF EXP 239 PUO SUB 2 IN DOGS.
L. S. Gomez. May 73, 84p
Contract AT(11-1)-1787

Descriptors: (*Plutonium 239, *Tissue distribution), (*Lymphatic system, *Radionuclide kinetics), (*Lymph nodes, Radionuclide kinetics), (*Liver, Radionuclide kinetics), Dogs, Particle size, Plutonium oxides, Response modifying factors, Retention, Spleen, Subcutaneous injection, Surgery, Translocation.

For abstract, see NSA 28 08, number 18570.

COO-3097-6/GA PC$4.50/MF$1.45
Allegheny General Hospital, Pittsburgh, PA. (Usa). Cellular and Radiation Biology Labs.
EFFECT OF RADIATION ON NORMAL HEMATOPOIESIS AND ON VIRAL INDUCED CANCERS OF THE HEMATOPOIETIC SYSTEM. THREE YEAR TECHNICAL PROGRESS REPORT, JUNE 1, 1970--APRIL 14, 1973.
J. P. OKunewick. 1973, 48p
Contract AT(11-1)-3097

Descriptors: (*Erythropoiesis, *Biological radiation effects), (*Hematopoietic system, Biological radiation effects), (*Leukemia, *Radiotherapy), Biological recovery, Blood, Bone marrow, Cfu, Hemoglobin, Homeostasis, Hormones, Lethal radiation dose, Mice, Photon beams, Reticulocytes, Spleen, Viruses, X radiation.

For abstract, see NSA 28 07, number 15732.

COO-3267-3/GA PC$3.50/MF$1.45
Jackson Lab., Bar Harbor, Maine.
RADIATION-INDUCED CHROMOSOMAL INVERSIONS IN MICE. PROGRESS REPORT, JUNE 1, 1972--MAY 31, 1973.
T. H. Roderick. 31 May 73, 28p
Contract AT(11-1)-3267

Descriptors: (*Chromosomal aberrations, *Radioinduction), Alkylating agents, Biological radiation effects, Cytology, Ems, Mice, Mutagens, Radiations.

For abstract, see NSA 28 07, number 15733.

HEDL-SA-548/GA PC$3.00/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
EBR-II DOSIMETRY TESTS.
J. L. Jackson, L. S. Kellogg, W. N. McElroy, and J. A. Ulseth. 1972, 23p CONF-730910-2
Contract AT(45-1)-2170

Descriptors: (*Ebr-2 reactor, *Neutron dosimetry), Neutron flux, Neutron spectra, Reactor operation, Testing.

For abstract, see NSA 28 08, number 20309.

LA-UR-73-678/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
BERYLLIUM, THE CRITERIA DOCUMENT.
H. F. Schulte. 1973, 13p CONF-730518-4
Contract W-7405-eng-36

Descriptors: (*Beryllium, *Toxicity), Health hazards, Personnel, Safety standards, Us aec, Usa.

For abstract, see NSA 28 07, number 15503.

LA-UR-73-931/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
APPLICATIONS OF PARTICLE ACCELERATORS AND PARTICLE COUNTING TECHNIQUES IN BIOLOGY AND RADIATION THERAPY.
M. R. Raju. 1973, 39p CONF-730541-1
Contract W-7405-eng-36

Descriptors: (*Fast neutrons, *Biological radiation effects), (*Protons, Biological radiation effects), (*Charged particles, Biological radiation effects), (*Pions minus, Biological radiation effects), Animal cells, Cell cycle, Depth dose distributions, In vitro, Let, Neoplasms, Oxygen, Radiation dose distributions, Radiotherapy, Response modifying factors, Testing, Tumor cells.

For abstract, see NSA 28 08, number 18466.

LA-5266-MS/GA PC$5.45/MF$1.45
Los Alamos Scientific Lab., N. Mex.
RECOMMENDATIONS FOR IMPLEMENTING RADIOTHERAPY WITH NEGATIVE PIONS AT LAMPF.
C. Richman, and D. E. Groce. May 73, 81p
Contract W-7405-eng-36

Descriptors: (*Radiotherapy, *Pions minus), Lampf linac, Recommendations.

For abstract, see NSA 28 07, number 15711.

LF-tr-79/GA PC$3.25/MF$1.45
RADIATION INJURY CAUSED BY CERIUM-144 IN DOGS, RABBITS, RATS, AND MICE.
V. N. Strel'tsova, and Yu. I. Moskalev. 24p
Translated from pp 224-236 of Raspredelenie biologicheskoy deistvie i migratsiya radioaktivnykh izotopov, 1961.

Descriptors: (*Dogs, *Radiosensitivity), (*Rabbits, Radiosensitivity), (*Rats, Radiosensitivity), (*Mice, Radiosensitivity), Biological effects, Cerium 144, Hematology, Hemorrhage, Life span, Liver, Neoplasms, Osteosarcomas, Pathology, Radiation injuries, Radionuclide kinetics.

For abstract, see NSA 28 07, number 15812.

N73-30771/2GA PC$3.00/MF$1.45
National Research Council of Canada, Ottawa (Ontario).
SOLAR ACTIVITY AND MANIFESTATIONS IN THE BIOSPHERE.
M. N. Gnevyshev, and K. F. Novikova. 1973, 11p
NRC-TT-1679
Tran-Transl. Into English from Zemlya Vselennaya (Moscow), V. 4, 1971 p 33-36.

Descriptors: *Animals, *Biological effects, *Diseases, *Human beings, *Solar activity, Biomedical data, Clinical medicine, Diseases, Earth hydrosphere, Heart, Lower atmosphere.

For abstract, see STAR 1121

ORNL-tr-2628/GA PC$6.00/MF$1.45
"ESDORA" COMPUTER CODE PROGRAM FOR AN ESTIMATE OF THE RADIATION DOSE IN THE EVALUATION AND RISKS FOR NUCLEAR POWER PLANTS AND RADIOACTIVE FACILITIES.
F. Diaz de la Cruz. 80p
Translated from a Spanish report.

Descriptors: (*Nuclear power plants, *Radiation hazards), (*Radiation doses, *Computer calculations), (*Human populations, Radiation doses), (*Computer codes, *E codes), Beta particles, Burnup, Containment buildings, Contamination, Earth atmosphere, Earth crust, Environment, Explosions, External irradiation, Fallout deposits, Fission products, Fortran, Gamma radiation, Gaseous wastes, Inhalation, Internal irradiation, Meteorology, Nuclear fuels, Organs, Radioactive clouds, Radioactive wastes, Radionuclide kinetics, Radionuclide migration, Reactor accidents, Stack disposal.

For abstract, see NSA 28 07, number 15712.

ORO-3728-6/GA PC$3.00/MF$1.45
Louisiana State Univ., Baton Rouge. Dept. Of Zoology and Physiology.
MUTAGENIC EFFECT OF TRANSMUTATION FROM RADIONUCLIDES INCORPORATED INTO DNA OF DROSOPHILA MELANOGASTER. PROGRESS REPORT, SEPTEMBER 1970--MAY 1973.
W. R. Lee. 1973, 8p
Contract AT(40-1)-3728

Descriptors: (*Phosphorus 32, Genetic radiation effects), (*Phosphorus 33, Genetic radiation effects), (*Genetic radiation effects, *Comparative evaluations), Beta sources, Chromosome breakage, Crossing-over, Delayed radiation effects, Drosophila, Energy levels, Internal irradiation, Lethal mutations, Mutations, Progeny, Recoils.

For abstract, see NSA 28 08, number 18564.

ORO-4241-3/GA PC$4.75/MF$1.45
Smithsonian Institution, Washington, D. C. Radiation Biology Lab.
STUDY OF THE BIOCHEMICAL EFFECTS OF IONIZING AND NONIONIZING RADIATION ON PLANT METABOLISM DURING DEVELOPMENT. PROGRESS REPORT, SEPTEMBER 1, 1972--AUGUST 31, 1973.
W. H. Klein. 1973, 52p
Contract AT(40-1)-4241

Descriptors: (*Phytochromes, *Purification), (*Solar radiation, *Radiation monitoring), (*Radiometers, *Calibration), (*Seeds, *Biological radiation effects), Chemical properties, Physical properties, Arabidopsis, Visible radiation, Panama, Testing, Ultraviolet radiation.

For abstract, see NSA 28 07, number 15703.

ORO-4394-1/GA PC$3.00/MF$1.45
Norfolk State Coll., VA. (Usa).
WIND EFFECTED REDISTRIBUTION OF SURFACE CONTAMINATION. PROGRESS REPORT, SEPTEMBER 1972--AUGUST 1973.
A. J. Amato. 1973, 5p

Contract AT(40-1)-4394

Descriptors: (*Surface contamination, *Distribution), Computer codes, Mathematical models, Meteorology, Radioactivity, Radionuclide migration, S codes, Soils, Turbulence, Variations, Wind.

For abstract, see NSA 28 07, number 15483.

PATENT-3 725 659/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
THERMOLUMINESCENCE DOSIMETER SYSTEM.
Patent,
John C. Culley. Filed 16 Mar 71, patented 3 Apr 73, 6p PAT-APPL-124 686
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Luminescent dosimeters, *Patents), Thermoluminescence, Spectrum analysis.
Identifiers: PAT-CL-250-71-R, *Thermoluminescent dosimetry.

The patent describes a system for obtaining radiation spectrum information using a single thermoluminescent (TL) dosimeter. After subjecting the single TL dosimeter to radiation in a manner so that a plurality of areas of the dosimeter experience radiation exposures which differ from each other, such as by overlaying the dosimeter with one or more radiation filters, at least a portion of the individual areas of differing radiation exposure are individually heated to thermoluminescence while the emitted light is observed. The information on the light emitted from the individual areas is then used to unfold the characteristics of the radiation to which the dosimeter was exposed.

RISO-278/GA PC$4.75/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
PLANT ACCUMULATION OF RADIOACTIVE STRONTIUM WITH SPECIAL REFERENCE TO THE STRONTIUM--CALCIUM RELATIONSHIP AS INFLUENCED BY NITROGEN.
A. J. Andersen. Jan 73, 53p
U.S. Sales Only.

Descriptors: (*Strontium 90, *Root absorption), (*Grass, *Radionuclide kinetics), (*Barley, Radionuclide kinetics), (*Oats, Radionuclide kinetics), Agriculture, Biological variability, Calcium, Fallout deposits, Fertilizers, Nitrogen, Phosphates, Plants, Radionuclide migration, Soils, Strontium, Strontium 88, Strontium 89, Tracer techniques, Uptake.

For abstract, see NSA 28 07, number 15484.

RLO-2225-T-15-16/GA PC$3.00/MF$1.45
Washington Univ., Seattle (Usa). Dept. Of Biochemistry.
FORMATION OF PHOTOREVERSIBLE CYCLOBUTANE-TYPE PYRIMIDINE DIMERS IN ULTRAVIOLET-IRRADIATED POTATO VIRUS X.
C. W. Huang, and M. P. Gordon. 1972, 18p
Contract AT(45-1)-2225

Descriptors: (*Pyrimidines, *Dimers), (*Viruses, *Biological radiation effects), Infectivity, Labelled compounds, Phosphorus 32, Radioinduction, Rna, Ultraviolet radiation.

For abstract, see NSA 28 08, number 18429.

RLO-2225-T-2-5/GA PC$3.75/MF$1.45
Washington Univ., Seattle. Coll. Of Fisheries.
LOW LEVEL CHRONIC IRRADIATION OF SALMON. ANNUAL PROGRESS REPORT.
W. K. Hershberger, L. R. Donaldson, K. Bonham, and E. L. Brannon. 22 Jun 73, 33p
Contract AT(45-1)-2225

Descriptors: (*Salmon, *Biological radiation effects), Aquatic ecosystems, Chronic irradiation, Dose-response relationships, Eggs, Embryos, Gamma radiation, Genetic radiation effects, Growth, Low dose irradiation, Mortality, Progeny, Survival time.

For abstract, see NSA 28 08, number 18515.

RLO-2227-T-8-4/GA PC$4.50/MF$1.45
Oregon State Univ., Corvallis.
RADIOECOLOGICAL STUDIES OF AMPHIBIANS. ANNUAL PROGRESS REPORT, JUNE 16, 1972--JUNE 15, 1973.
D. L. Willis. 1973, 46p
Contract AT(45-1)-2227

Descriptors: (*Cobalt 60, *Distribution), (*Salamanders, *Biological radiation effects), (*Frogs, *Radionuclide kinetics), (*Zinc 65, *Metabolism), Blood, Cesium 134, Embryos, Ionizing radiations, Liver, Melanin, Mercury 203, Molluscs, Oils, Radioecology, Retention, Skin, Spleen, Survival time, Synergism, Uptake.

For abstract, see NSA 28 07, number 15735.

SAN-410-157/GA PC$3.25/MF$1.45
Scripps Clinic and Research Foundation, la Jolla, Calif.
BASIC STUDIES OF THE IMMUNE RESPONSE AND THE EFFECTS OF RADIATION ON THIS RESPONSE. COMPREHENSIVE REPORT, OCTOBER 1, 1970--MAY 31, 1973.
F. J. Dixon, and W. O. Weigle. 27 Jun 73, 24p
Contract AT(04-3)-410

Descriptors: (*Immune reactions, *Biological radiation effects), (*Animal cells, Immune reactions), (*Macrophages, Immune reactions), (*Lymphocytes, Immune reactions), Drugs, Immunity, Immunosuppression, Lethal irradiation, Mice, Photon beams, Viruses, X radiation.

For abstract, see NSA 28 08, number 18516.

SU-326-P-32-X-2/GA PC$3.00/MF$1.45
Stanford Univ., Calif.
DNA REPAIR IN BACTERIOPHAGE T4. ANNUAL PROGRESS REPORT.
1973, 10p
Contract AT(04-3)-326

Descriptors: (*Dna, *Biological radiation effects), (*Bacteriophages, *Biochemical reaction kinetics), (*Animal cells, Biological radiation effects), (*Nucleases, Biochemical reaction kinetics), Biological repair, Dimers, Photon beams, Pyrimidines, Thymine, Tracer techniques, Tritium, Ultraviolet radiation, X radiation.

For abstract, see NSA 28 07, number 15679.

UCR-34-P-51-36/GA PC$5.75/MF$1.45
California Univ., Riverside (Usa). Dept. Of Soil Science and Agricultural Engineering.
BEHAVIOR OF CERTAIN SYNTHETIC CHELATING AGENTS IN BIOLOGICAL SOIL SYSTEMS. ANNUAL PROGRESS REPORT.
A. Wallace. 15 May 73, 74p
Contract AT(04-3)-34

Descriptors: (*Soils, *Radionuclide migration), (*Dtpa, *Chemical reactions), (*Plants, *Radionuclide kinetics), Aluminium isotopes, Cobalt isotopes, Copper isotopes, Glycine hispida, Iron isotopes, Lead isotopes, Manganese isotopes, Molybdenum isotopes, Nickel isotopes, Ph value, Phaseolus, Response modifying factors, Tin isotopes, Tissue distribution, Titanium isotopes, Uptake, Zinc isotopes.

For abstract, see NSA 28 08, number 18576.

UR-3055-7/GA PC$12.50/MF$1.45
Rochester Univ., N. Y. Dept. Of Radiation Biology and Biophysics.
RECOVERY OF SPERMATOGONIA IN RAT TESTES AFTER DEPLETION BY SINGLE AND FRACTIONATED X-RAY EXPOSURES.
N. G. Timberlake. 1973, 209p

Descriptors: (*Testes, Biological radiation effects), (*Epithelium, *Biological recovery), (*Biological radiation effects, *Fractionated irradiation), (*Spermatogenesis, Biological radiation effects), Acute irradiation, Animal cells, Dose-response relationships, Germ cells, Microscopy, Morphological changes, Radiation doses, Rats, Spermatozoa, Time dependence, X radiation.

For abstract, see NSA 28 07, number 15736.

6S. Stress Physiology

AD-768 397/2GA PC$3.00/MF$1.45
Ocean Systems Inc Tarrytown N Y
MECHANISM AND DETECTION OF DECOMPRESSION SICKNESS.
Final rept. 1 May 69-28 Feb 73,
Michael R. Powell, Robert W. Hamilton, Jr., and Gerald F. Doebbler. 25 Apr 73, 13p
Contract N00014-69-C-0346
See also report dated 15 Dec 71, AD-739 700.

Descriptors: (*Decompression sickness, Detection), Stress(Physiology), Etiology, Pathology, Physiology, Pressure, Blood circulation, Gas embolism, Rats, Experimental data, Ultrasonic radiation, Bubbles.
Identifiers: *Ultrasonic tests.

The report describes the work and results found during studies conducted to elucidate the basic physiology, biochemistry and biophysics involved in the etiology of decompression sickness. Investigated were gas transport in living tissue by means of in vivo probes and mass spectrometric analysis, bubble growth in the tissue microcirculatory system using through-transmission ultrasound, bubble distribution in the major circulatory pathways with both doppler ultrasound flowmeters and visual inspection, and the changes in serum biochemistry following varying degrees of decompression injury. Experiments have been conducted on rats, miniature pigs, and men as the subjects.

AD-768 853/4GA PC$3.75/MF$1.45
Teer (James G) and Co College Station Tex
STUDIES OF THE EFFECTS OF SONIC BOOM ON BIRDS.
Final rept. 1 Mar-15 Aug 73,
James G. Teer, and Joe C. Truett. Sep 73, 90p
FAA-RD-73-148
Contract DOT-FA72WAI-238

Descriptors: (*Sonic boom, *Birds), Reproduction(Physiology), Growth, Mortality rates, Survival, Airplane noise, Airports.

A field study was carried out near Glen Rose, Texas to try to discover if occurrence of sonic booms created by overflying aircraft was adversely affecting reproduction of wild birds. Several measures of reproduction success in mourning doves, mockingbirds, cardinals, and lark sparrows were compared between a test area and a control area. The test area was subject to sonic boom occurring two or three times a week; the control area was essentially free from sonic boom disturbance. In the final analysis, the authors could find no evidence that sonic boom disturbance affected phases of bird reproduction studies in the program. Studies of the effects of pressure on growth, reproduction and mortality of bobwhite quail were made in the laboratory with equipment designed to deliver pressure treatments under controlled conditions. Results of these experiments showed that the pressures had no effects on hatching success, growth rates, or mortality. (Modified author abstract)

AD-769 022/5GA Reprint
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
DYNAMIC CHARACTERISTICS OF THE HUMAN BODY,
H. E. von Gierke. 1973, 12p Rept no. AMRL-TR-72-53
Availability: Pub. in Perspectives in Biochemical Engineering, p193-202 1973.

Descriptors: (*Body, Dynamics), Mechanical properties, Vibration, Impact.
Identifiers: *Biodynamics, Biomechanics.

A discussion of the body's dynamic response to vibration and impact is presented.

COM-73-11839/0GA Reprint
Rhode Island Univ., Kingston. Graduate School of Oceanography.
A STRESS SYNDROME IN THE HARD CLAM, 'MERCENARIA MERCENARIA',
H. Perry Jeffries. 21 Jan 72, 12p NOAA-73101006
Sponsored in part by Environmental Protection Agency, Washington, D.C.
Pub. in Jnl. of Invertebrate Pathology, v20 n3 p242-251 Nov 72.

Descriptors: (*Clams, Stress(Physiology)), (*Water pollution, Clams), Pelecypoda, Mollusca, Amino acids, Estuaries, Rhode Island, Shellfish, Taurine, Glycine, Homeostasis, Hydrocarbons, Marine atmospheres, Parasites, Annelida, Infections.
Identifiers: Water pollution effects(Animals), Sea Grant program, Mercenaria mercenaria, Polydora, Polycheata, Quahoge.

The hard clam, Mercenaria mercenaria, shows a general response to environmental variation and infection. The molar ratio of free taurine to glycine in gill and mantle tissues climbs above three, while alpha-amino acids and carbohydrates decrease. Subtle adjustments in the total pattern of free amino acids and fatty acids also occur, but these can be readily seen by changes in biochemical diversity and equitability. In an estuary long polluted with hydrocarbons, the clam population has a patchy distribution and a short life-span. These variations are attributed to a culmination of abnormal complications superimposed on natural responses to a seasonally changing environment. The process apparently starts after a tarlike irritant collects in epithelial tissue and eventually plugs the renal sac. This leads, indirectly, to invasion of shells by Polydora sp., a polychaete which is rearely found in hard clams. A syndrome with many facets soon becomes clear, but the situation can be identified and its results predicted by simply observing the responses of taurine and glycine in stressed and normal populations.

N73-30060/0GA PC$3.25/MF$1.45
Scripta Technica, Inc., Washington, D.C.
MOLECULAR MECHANISMS OF ADAPTATION TO HYPOXIA.
F. Z. Meyerson. Aug 73, 24p NASA-TT-F-15058
Contract NASW-2484
Tran-Transl. Into English from Priroda (Moscow), No. 6, 1972 p 74-81.

Descriptors: *Adaptation, *Enzymes, *Hypoxia, *Respiratory physiology, Adenosine triphosphate (Atp), Deoxyribonucleic acid, Ribonucleic acids.

For abstract, see STAR 1121

N73-30065/9GA PC$6.35/MF$1.45
Techtran Corp., Silver Spring, Md.
PROBLEMS OF SPACE BIOLOGY. VOLUME 21: TISSUE OXYGEN UNDER EXTREME FLIGHT FACTORS.
Y. A. Kovalenko, and I. N. Chernyakov. Aug 73, 264p NASA-TT-F-762
Contract NASW-2037
Tran-Transl. Into English of the Book "Problemy Kosmicheskoy Biologii, Tom 21, Kislorod Tkaney Pri Ekstemal'Nykh Faktorakh Poleta" Moscow, Nauka Press, 1972 264 p.

Descriptors: *Exobiology, *Flight altitude, *Hyperoxia, Atmospheric models, Brain, Prophylaxis.

For abstract, see STAR 1121

N73-30069/1GA PC$3.25/MF$1.45
Ohio State Univ. Research Foundation, Columbus. Dept. of Aeronautical and Astronautical Engineering.
FLUID DYNAMIC ASPECTS OF CARDIOVASCULAR BEHAVIOR DURING LOW-FREQUENCY WHOLE-BODY VIBRATION.
Final Report, 1 Nov. 1968 - 31 Oct. 1972.
R. M. Nerem. Apr 73, 25p NASA-CR-133843, REPT-15
Contracts NGL-36-008-117, RF PROJ. 2732

Descriptors: *Cardiovascular system, *Fluid dynamics, *Low frequencies, *Vibration effects, Blood vessels, Heart function, Manned space flight.

For abstract, see STAR 1121

N73-30070/9GA PC$5.50/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bad Godesberg (West Germany). Inst. fuer Flugmedizin.
EFFECTS OF TIME SHIFT ON DIURNAL RHYTHMS OF 17-HYDROXY CORTICOSTEROIDE AUSWIRKUNGEN DER ZEITVERSCHIEBUNG AUF DIE TAGESRHYTHMIK DER 17-HYDROXYCORTICOSTEROIDE.
Ph.D. Thesis - Bonn Univ.
U. Dierlich. 20 Mar 73, 68p DLR-FB-73-58
In German; English Summary.

Descriptors: *Circadian rhythms, *Flight conditions, *Human factors engineering, *Hydroxycorticosteroid, *Synchronism, Adrenal metabolism, Aerospace medicine, Excretion, Flight stress (Biology), Time dependence.

For abstract, see STAR 1121

N73-30071/7GA PC$5.50/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bad Godesberg (West Germany). Inst. fuer Flugmedizin.
CONTRIBUTION OF THE ANTICIPATION STRESS TO TOTAL FLIGHT STRESS AND ITS DEPENDENCE ON DIURNAL RHYTHM, MEASURED BY PHYSIOLOGICAL PARAMETERS DER ANTEIL DER ERWARTUNGSSPANNUNG AN DER FLIEGERISCHEN GESAMTBELASTUNG UND IHRE ABHAENGIGKEIT VOM TAGESRHYTHMUS, GEMESSEN AN PHYSIOLOGISCHEN GROESSEN.
Ph.D. Thesis - Bonn Univ.
P. Kroll. 27 Jun 72, 69p DLR-FB-72-39
In German; English Summary.

Descriptors: *Circadian rhythms, *Flight stress (Biology), *Physiological factors, *Pilot performance, *Preflight analysis, Flight simulators, Preconditioning, Psychosomatics, Task complexity.

For abstract, see STAR 1121

N73-30073/3GA PC$5.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bad Godesberg (West Germany). Inst. fuer Flugmedizin.
CIRCADIAN RHYTHM VARIATIONS OF CIRCULATION RESPRIRATION, AND CATABOLISM UNDER FLIGHT STRESS CONDITIONS TAGESRHYTHMISCHE SCHWANKUNGEN VON KREISLAUF, ATMUNG UND GASSTOFFWECHSEL UNTER FLIEGERISCHER BELASTUNG.
Ph.D. Thesis - Bonn Univ.
W. Steinhoff. 26 Jul 72, 59p DLR-FB-72-49
In German; English Summary.

Descriptors: *Blood circulation, *Catabolism, *Circadian rhythms, *Flight stress (Biology), *Respiratory rate, Aerospace medicine, Flight simulation, Pilot performance, Respiratory physiology.

For abstract, see STAR 1121

N73-30093/1GA PC$5.50/MF$1.45
Southampton Univ. (England). Inst. of Sound and Vibration Research.
A SURVEY OF HUMAN RESPONSE TO VIBRATION RESEARCH IN GREAT BRITAIN.
M. J. Griffin. Mar 73, 66p ISVR-TR-60

Descriptors: *Great britain, *Human factors laboratories, *Physiological responses, *Vibration effects, *Vibration simulators, Bibliographies, Frequency ranges, Human performance, Thresholds (Perception), Vibration meters.

For abstract, see STAR 1121

N73-30992/4GA PC$3.00/MF$1.45
Techtran Corp., Silver Spring, Md.
THE SECOND ORBITAL FLIGHT.
A. Nikolayev. Sep 73, 11p NASA-TT-F-15076
Contract NASW-2485
Tran-Transl. Into English from Aviat. Kosmonavt. (Moscow), No. 7, Jul. 1973 p 32-34.

Descriptors: *Manned space flight, *Physical factors, *Physiological responses, Aerospace medicine, Soyuz spacecraft, Space flight stress, Weightlessness.

For abstract, see STAR 1122

N73-30993/2GA PC$3.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
EFFECT OF CORIOLIS ACCELERATION ON THE VESTIBULAR APPARATUS OF A COSMONAUT AND ITS EXPERIMENTAL STUDY IN THE LABORATORY.
F. A. Solodovnik, and L. M. Vorobyev. Sep 73, 14p NASA-TT-F-15129
Contract NASW-2483
Tran-Transl. Into English from the Publ. "Problemy Bioniki" Moscow, Nauka, 1973 p 53-58.

Descriptors: *Astronauts, *Coriolis effect, *Experimental design, *Vestibules, Biological effects, Environment simulation.

For abstract, see STAR 1122

N73-30994/0GA PC$3.50/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
SLEEP AND CEREBRAL TEMPERATURE IN THE RAT DURING THE CHRONIC EXPOSURE TO A HOT ENVIRONMENT.
J. L. Valatx, B. Roussel, and M. Cure. Sep 73, 26p NASA-TT-F-15082
Contract NASW-2483
Tran-Transl. Into English from Brain Res. Amsterdam, V. 55, 1973 p 107-122.

Descriptors: *Ambient temperature, *Cerebrum, *Circadian rhythms, *Rats, *Sleep, Biological effects, Controlled atmospheres, Experimental design.

For abstract, see STAR 1122

N73-31015/3GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.

SOME PROPERTIES OF A MATHEMATICAL ANALOG OF THE CENTRAL PORTION OF A VESTIBULAR ANALYZER.
O. G. Gazenko, and N. A. Chekhonadskiy. Sep 73, 15p NASA-TT-F-15130
Contract NASW-2481
Tran-Transl. Into English of the Book "Problemy Bioniki" Moscow, Nauka Press, 1973 p 45-53.

Descriptors: *Acceleration tolerance, *Analog simulation, *Neurons, *Vestibular tests, Environment simulation, Exobiology, Phase shift.

For abstract, see STAR 1122

N73-31022/9GA PC$4.50/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bad Godesberg (West Germany). Inst. fuer Flugmedizin.
CHANGE IN CIRCADIAN RHYTHM OF PSYCHOMOTOR PERFORMANCE AFTER TRANSMERIDIAN FLIGHTS.
Ph.D. Thesis - Bonn Univ.
M. Bodanowitz. 6 Mar 73, 48p DLR-FB-73-52
In German; English Summary.

Descriptors: *Circadian rhythms, *Flight time, *Psychomotor performance, *Time lag, Flight stress (Biology), Human performance, Performance prediction, Physiological effects, Synchronism.

For abstract, see STAR 1122

N73-31024/5GA PC$3.75/MF$1.45
Royal Naval Personnel Research Committee, London (England).
EFFICIENCY IN HEAT AFTER A NIGHT WITHOUT SLEEP.
E. C. Poulton, R. S. Edwards, and W. P. Colquhoun. Dec 71, 34p OES-8/72, BR-35739

Descriptors: *Auditory tasks, *Heat, *Human performance, *Sleep deprivation, *Stress (Physiology), *Visual tasks, Arousal, Human reactions, Luminaires, Reaction time, Tracking (Position).

For abstract, see STAR 1122

N73-31144/1GA PC$3.50/MF$1.45
Defence and Civil Inst. of Environmental Medicine, Downsview (Ontario). Biosciences Div.
DIGITAL COMPUTATION OF DECOMPRESSION PROFILES.
R. Y. Nishi, and L. A. Kuehn. Jan 73, 29p DCIEM-884

Descriptors: *Analog computers, *Computer programming, *Pneumatic equipment, *Pressure reduction, Digital techniques, Diving (Underwater), Flight altitude, Fortran.

For abstract, see STAR 1122

PB-224 408/5GA PC$6.50/MF$1.45
Environmental Protection Agency, Washington, D.C. Office of Noise Abatement and Control.
IMPACT CHARACTERIZATION OF NOISE INCLUDING IMPLICATIONS OF IDENTIFYING AND ACHIEVING LEVELS OF CUMULATIVE NOISE EXPOSURE.
Final rept.
27 Jul 73, 296p EPA-NTID73.4

Descriptors: (*Acoustic environments, *Physiological effects), (*Noise(Sound), *Airports), (*Aircraft noise, Acoustic measurement), Noise reduction, Environmental engineering, Auditory defects, Voice communication, Environmental surveys, Recommendations.
Identifiers: Noise annoyance, Noise exposure, Hearing loss, Noise levels, Environmental noise exposure measurement, Noise indexes, *Noise pollution.

The report is a result of an extensive task force effort to gather all available data pertinent to impact characterization of noise including implications of identifying and achieving levels of cumulative noise exposure. It represents the interpretation of such data by the task group chairman responsible for this specific report. It does not necessarily reflect the official views of EPA and does not constitute a standard, specification or regulation.

6T. Toxicology

AD-768 491/3GA Reprint
Army Medical Research and Nutrition Lab Denver Colo
MORPHOMETRIC EVALUATION OF PULMONARY LESIONS IN RATS EXPOSED TO OZONE,
Charles G. Plopper, D. L. Dungworth, and W. S. Tyler. 3 Mar 73, 14p
Availability: Pub. in The American Jnl. of Pathology, v71 n3 p395-404 Jun 73.

Descriptors: (*Lungs, *Ozone), Toxicity, Pathology, Histology, Respiratory system, Concentration(Chemistry), Air pollution.

Four hours exposure to 3 ppm ozone produces morphometrically quantifiable alterations in the lungs of rats. Lungs of exposed rats were fixed either immediately after exposure or after a 12-hour recovery period, and the tissue was evaluated using stereologic technics with both the light and electron microscopes. Immediately after exposure, the volume fraction of nonparenchymal tissue was larger (0.057) than for controls (0.045); that of the lumina of large vessels decreased (0.039) from the control value (0.059). The nonparenchymal tissue fraction was 0.053 12 hours later, while the luminal fraction (0.054) resembled the control value. The volume fractions of parenchyma, total tissue and air space showed only slight changes. Ozone also affects all three components of the air-blood barrier, primarily by the production of intracellular edema. The arithmetic mean thickness of the pulmonary blood-air barrier increased from 1.385 plus or minus 0.095 micron in unexposed rats to 1.700 plus or minus 0.189 micron in rats immediately after exposure. Partial recovery of total barrier thickness (1.582 plus or minus 0.292 micron) occurred 12 hours after exposure. (Modified author abstract)

AD-768 695/9GA PC$2.75/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
A MINICULTURE CYTOTOXICITY ASSAY SYSTEM MEASUREMENT OF CELL NUMBER AND VIABILITY BY LASER CYTOGRAF.
Technical rept. Jul 72-Mar 73,
Vincent F. Garry, Jr., and Robert D. Moore. Sep 73, 15p Rept nos. EB-TR-73020, EA-TR-4790

Descriptors: (*Cells(Biology), Chemicals), (*Chemicals, Toxicity), Drugs, Viability, Morphology(Biology), Tissue culture cells, In vitro analysis.
Identifiers: *Cytotoxicity.

A multiculture system employing confluent monolayers of embryonic human skin fibroblasts has been developed for the purpose of in vitro cytotoxic screening of chemical materials. The parameters of observation used in these experiments are cell number and cell viability as measured in trypan blue dye exclusion. These measurements were automated by the use of the Model 6301 laser Cytograf. (Modified author abstract)

N73-30067/5GA PC$14.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
THE OXIDES OF MANGANESE: THEIR COMPARATIVE TOXICITY AND HYGIENIC IMPORTANCE AND THE CLINICAL MEDICINE OF CHRONIC MANGANESE EXPOSURE.
N. V. Lazarev, and E. N. Levina. 4 Sep 73, 236p NASA-TT-F-15000
Contract NASW-2483
Tran-Transl. Into English from State Publishing House for Med. Lit. (Leningrad), 1962 176 p.

Descriptors: *Clinical medicine, *Manganese oxides, *Toxicity and safety hazard, Chronic conditions, Hygiene, Pathogenesis.

For abstract, see STAR 1121

ORNL-EIS-73-16/GA PC$17.25/MF$1.45
Oak Ridge National Lab., Tenn.
ARSENIC IN THE ENVIRONMENT. AN ANNOTATED BIBLIOGRAPHY.
E. D. Copenhaver, G. U. Ulrikson, L. T. Newman, and R. I. Jr. Van Hook. Jul 73, 304p
Contract W-7405-eng-26

Descriptors: (*Arsenic, *Bibliographies), Environment, Toxicity.

For abstract, see NSA 28 07, number 17787.

PB-224 052/1GA PC$3.50/MF$1.45
Mason Research Inst., Worcester, Mass. Dept. of Pharmacology and Toxicology.
CCNU (NSC-79 037): TOXICITY OF A SINGLE IV INFUSION IN DOGS. VEHICLE: EMULPHOR EL-620 5%, ETHANOL 5%, AND SALINE 90%.
Research rept. 15 Sep-1 Nov 72,
U. Schaeppi, R. W. Sleischman, R. S. Phelan, D. A. Cooney, and R. D. Davis. 23 Apr 73, 54p MRI-CC03-73-21
Contract PHS-71-2055
See also PB-221 349.

Descriptors: (*Antineoplastic agents, *Toxicology), (*Drugs, Toxicology), (*Malignant neoplasms, Drugs), Dosage, Dose rate, Parenteral infusions, Bioassay, Dogs, Hematology, Testis, Bone marrow, Blood chemical analysis, Liver, Kidney, Pathology, Histology.
Identifiers: *Urea/chloroethyl-cyclohexyl-nitroso, Emulphor.

Groups of 2 dogs were infused intravenously (within approximately 60 min) with CCUN, an antineoplastic agent (1.5 mg/ml in Emulphor EL-620-5%, ethanol-5%, and saline-90%), in doses of 10, 5, 2.5, 1.25, 0.625 mg/kg and with the control vehicle. Treatment caused acute toxicity of bone marrow and lymphoid tissues, and one-half dogs treated with 10 mg/kg died on day 8 from agranulocytosis with subsequent necrotic tonsillitis and bacteremia. Doses of 10, 5, and 2.5 mg/kg led to dose-related transient neutropenia with nadir on day 7; 10, 5, 2.5, and 1.25 mg/kg caused delayed hepatic toxicity with elevation of sulfobromo phthalein sodium retention, adenosine phosphates, the transaminases (SGOT and SGPT), and occasionally bilirubin. Maximum elevation of SGPT occured from 23 to 37 days after treatment. One of the survivors exhibited degeneration of the testes; the others had no histopathological lesions. Infusion with 10 and 5 mg/kg and with 6.6 ml/kg of the vehicle caused transient hemolysis with a maximum of 3.5 mg%, but without hemoglobinuria. CCNU infused with Emulphor EL-620 caused qualitatively the same toxicity as with the previously used vehicle, propylene glycol-80%, ethanol-20%, but was possibly somewhat less toxic.

PB-224 089/3GA PC$3.00/MF$1.45
Rancho Los Amigos Hospital, Downey, Calif.
STUDIES ON THE EFFECTS OF OXYGEN TOXICITY ON CELL DIVISION IN THE LUNG ALVEOLI OF SQUIRREL MONKEYS.
Annual rept. Jul 72-Jun 73,
Jack D. Hackney, Michael J. Evans, Robert F. Bils, and Frederick C. Thiede. 23 Jul 73, 38p
NIH/NHLI-71-2151-02
Contract PHS-71-2151
See also report dated Jul 72, PB-222 161.

Descriptors: (*Oxygen toxicity, *Lung), (*Alveoli pulmonis, Cell division), (*Cell division, Oxygen toxicity), Monkeys, Cells(Biology), Edema, Pathology, Histology, Biosynthesis, Deoxyrihonucleic acids, Thymidines, Experimental data.

Twenty-six male animals were exposed to 100% O2 for up to 5 days; 13 were controls. Animals from each group were sacrificed daily. Mortality was high in the experimental animals, with 2 dead at 96 hours and 2 more by 120 hours. Histologically a progressive perivascular edema was found plus increasing vacuolation of the type 2 cells. After 4 days, striking electron dense inclusions were see in type 2 cells and some tissue destruction was found. Cell labeling studies indicated an initial decrease followed by an increase. The large increase at 120 hours was due mainly to an increase in the number of dividing type 2 cells. Sixteen male animals were exposed to approximately 60% O2 in a closed chamber maintained at atmospheric pressure for up to 8 days. As controls, 4 additional monkeys were exposed to room air in a similar chamber. Four exposed animals were sacrificed at 1, 2, 4, and 8 days, with 2 controls sacrificed at 2 and 8 days. Little difference in labeling index was found in these experiments.

PB-224 376/4GA PC$10.00/MF$1.45
Hazleton Labs., Inc., Vienna, Va.
TOXICOLOGY OF PLASTIC DEVICES HAVING CONTACT WITH BLOOD ACUTE AND SUBACUTE TOXICITY OF DI(2-ETHYLHEXYL) PHTHALATE IN DOGS.
Annual rept. 29 Jun 72-1 Oct 73,
Henry A. Rutter, Jr. 1 Oct 73, 158p
Contract PHS-72-2991B

Descriptors: (*Plasticizers, *Toxicity), (*Phthalates, Toxicity), Bioassay, Dogs, Dosage, Lung, Respiration, Medical equipment, Medical supplies, Tables(Data).
Identifiers: Biomaterials.

A single dose of 30, 100, 300, and 1000 mg/kg of di(2-ethylhexyl) phthalate was administered to beagles. A dose of 1000 mg/kg caused death of one of two dogs the day following the day of dosage. Toxic signs included increased respiration, decreased activity, and emesis. A repeated dose of 50, 100, 300, and 500 mg/kg/day of di(2-ethylhexyl) phthalate was administered to beagles for 14 days. One of two dogs which received 300 mg/kg/day died on the fourth day of dosing. The two dogs which received 500 mg/kg/day died on the day following the fourth and eighth day of dosing, respectively. Toxic signs included increased respiration, decreased activity, and emesis.

PB-224 454/9GA PC$3.00/MF$1.45
Michigan Univ., Ann Arbor. Div. of Research Development and Administration.
ACCUMULATION, TOXICITY, AND METABOLISM OF COMMON PLASTICIZERS IN HUMANS.
Annual rept. 1 Dec 72-15 Sep 73,
Edward A. Napier, Jr. Oct 73, 43p* 011711-1-P
Contract PHS-73-2936-B

Descriptors: (*Phthalates, Toxicity), (*Plasticizers, *Toxicity), Metabolism, Humans, In vivo analysis, In vitro analysis, Tissue culture, Blood cells, Blood plasma, Blood coagulation, Medical equipment, Artificial kidneys, Tubes.
Identifiers: Hemodialysis, *Biomaterials.

To study the accumulation, toxicity, and metabolism of common plasticizers in humans, both in vitro and in vivo techniques are being employed; and to note the present chronic accumulation of these plasticizers in humans, a program was initiated to monitor these plasticizers in variour normal and abnormal human tissues. For the in vitro studies, the toxicity and metabolic fate of these plasticizers is being studied in human cell cultures and blood cells. Another important in vitro technique is the study of the release of the plasticizers into fluids used in hemodialysis units and in units of blood and blood products commonly employed in hospitals at the present. In vivo studies are also planned on their absorption in humans (through standard balance techniques); their mode of transport in the vascular system, particularly with respect to lipoprotein carriers; and their metabolic fate subsequent to both peroral and intravenous administration. The chronic accumulation of these plasticizers are monitored in various tissues from both normal and abnormal subjects. This will be attempted through assay on various excised tissues such as heart, kidney, spleen and lung.

PB-224 556/1GA PC$2.75/MF$1.45
Duke Univ., Durham, N.C. Div. of Radiobiology.
O2 THERAPY VS O2 TOXICITY AND METHODS OF VENTILATORY ASSIST.
Annual rept. 10 Jun 72-10 Jun 73,
Aaron P. Sanders. 17 Jul 73, 16p NHLI-71-2154-A73
Contract N01-HR1-2154

Descriptors: (*Oxygen toxicity, Protective treatments), (*Hyperbaric oxygenation, Protective treatment), Lung, Respiration, Phosphorylation, Oxidoreductases, Glutathione, Succinates, Metabolism, Biochemistry.

Sprague-Dawley rats (150-200g) were exposed to 2.0 ATA oxygen for 12, 15 or 18 hours, or to 1.5 ATA oxygen for 18, 24, 27, or 30 hours, or to 1.0 ATA oxygen for 24, 72, 96, 120, 144, or 168 hours. Respiration and oxidative phosphorylation, succinic dehydrogenase acitivity, ATP concentration, ATPase activity, total and % free cathepsin and ribonuclease activities, and lipid peroxide levels were determined on the lung from animals subjected to each of the exposure conditions. Decreased succinic dehydrogenase activity, respiration and oxidative phosphorylation, ATP concentration, and total cathepsin and ribonuclease activities were observed in the lung of animals exposed to 1.0 ATA oxygen, or 1.5 ATA oxygen or 2.0 ATA oxygen. Adrenalectomized animals were not protected against these metabolic changes. Lipid peroxide levels, ATPase activity, and % free cathepsin and ribonuclease activities were not changed significantly.

PB-224 558/7GA PC$4.25/MF$1.45
Utah Univ., Salt Lake City.
TOXICOLOGY OF PLASTIC DEVICES HAVING CONTACT WITH BLOOD.
Interim rept. for 24 Aug 72-15 Sep 73,
Robert V. Petersen, David J. Lyman, David B. Roll, and Ewart A. Swinard. Sep 73, 117p*
NIH/NHLI-72-6
Contract NIH-NHLI-73-2908-B

Descriptors: (*Plastics, *Blood), (*Toxicology, Plastics), (*Plasticizers, Toxicology), Medical supplies, Polyvinyl chloride, Addition resins, Elastomers, Thermoplastic resins, Tissue culture, Medical equipment, Mechanical organs, Experimental data, Phthalates, Bioassay, Humans, Laboratory animals.
Identifiers: Phthalic acidbis(ethylhexyl-ester), Biocompatible materials, *Blood compatible materials.

The project is primarily concerned with toxicological evaluation of polyvinyl chloride and, more specifically, the commonly used plasticizer, di(2-ethylhexyl) phthalate (DEHP). The project is divided into twelve tasks including an organizational phase. Plastic composition studies, acute toxicity studies, tissue culture studies, subacute toxicity studies, metabolite identification, teratogenic studies, neurologic studies, larger animal studies, analyses of human blood exposed to plastics during hospital procedures, and possible statistical analysis of human patients following extensive exposure of blood to plastics. Selected findings indicate that: DEHP is poorly absorbed from i.p. = intraperitoneal administration of massive doses; the 30-day subacute i.v. = intravenous LD50 of DEHP in mouse serum is 355 mg/kg in mice; DEHP accumulates in lungs of dogs for at least 2 weeks during daily i.v. = intravenous administration; an efficient method for analyzing DEHP by gas chromatography utilizing an internal standard has been developed; and some components of renal dialysis and cardiac bypass units are toxic to L929 cells by tissue culture methods. Portions of this document are not fully legible.

PB-224 646/0GA PC$5.25/MF$1.45
Ohio State Univ. Research Foundation, Columbus.
AN INVESTIGATION OF THE EFFECTS OF CARBON MONOXIDE ON HUMANS IN THE DRIVING TASK.
Final rept.,
F. W. Weir, M. M. Mehta, T. H. Rockwell, and D. A. Attwood. Jan 73, 178p* CRC-APRAC-CAPM-9-69-1

Descriptors: (*Carbon monoxide poisoning, *Psychomotor tests), (*Motor vehicle operators, *Hypoxia), Road test, Laboratories, Visual perception, Responses, Reaction time, Delay time, Research, Performance evaluation, Stress(Physiology), Toxicology.
Identifiers: Carboxyhemoglobin, Information processing(Psychology).

A two-year investigation of the effects of carboxyhemoglobin on human performance involved the testing of 40 subjects on the highway with a battery of real driving situations and/or laboratory tasks related to driving skills. In all, 24 tasks were developed and over 130,000 observations were taken. Driving performance was categorized into three levels: visual perception and information acquisition, control (psychomotor), and dynamic response.

7. CHEMISTRY

7A. Chemical Engineering

AD-768 691/8GA PC$3.25/MF$1.45
Summa Corp Culver City Calif Hughes Helicopters Div
EVALUATION OF THE EFFECTS OF CONTAMINATION BY SILICATES OF ANODIZING SEAL WATER.
Final rept. May-Jul 73,
John M. Hogue, and John C. French. Jul 73, 24p
Rept no. HH-73-44 USAAVSCOM-TR-73-11
Contract DAAJ01-73-C-0378

Descriptors: (*Aluminum, *Corrosion resistance), (*Anodic coatings, Aluminum), Silicates, Adhesion.
Identifiers: Anodizing, Performance evaluation, Peel tests, Salt spray tests.

An evaluation of the effects of contamination by silicates in the seal water on chromic acid anodized aluminum was performed. The results of the standard salt spray test indicate that the resistance to corrosion was drastically reduced as the silicates increased above 4 parts per million. The amount of corrosion obtained was in proportion to amounts of silicates from 3 to 10 parts per million. No effect was found on adhesive bond strength as measured by T-peel tests, when rinsing, following chromic acid anodizing, with water containing 1 to 100 parts per million of silicate. (Modified author abstract)

AD-768 744/5GA PC$3.00/MF$1.45
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
INVESTIGATION OF EXPLOSION OF PORTABLE LIQUID OXYGEN/LIQUID NITROGEN GENERATING PLANT.
Final rept.,

M. Perlman. 24 Sep 73, 11p Rept no. NADC-73204-30

Descriptors: (*Gas generating systems, Explosions), (*Explosions, *Liquefied gases), Oxygen, Nitrogen, Hydrocarbons, Filters(Fluid), Production.
Identifiers: Liquid oxygen, Liquid nitrogen.

An investigation was made to determine the possible cause of an explosion in the portable air separation plant operated by the Compressed Gas School, Portsmouth Naval Shipyard, Virginia. Plant intake air and filtration bed residues were analyzed. A hydrocarbon oil residue was found in the silica gel filtration bed. (Author)

AEC-tr-7449/GA PC$3.00/MF$1.45
EXPERIENCES WITH ACTIVATED HYDRAZINE FOR CHEMICAL DEGASSING.
H. Kallfass. 10p
Translation of pp 2-5 from the VGB Feedwater Conference, Essen, Germany, 1970.

Descriptors: (*Hydrazine, *Degassing), Corrosion, Oxygen, Steam, Water.

For abstract, see NSA 28 08, number 20596.

AEEW-R-859/GA PC$3.25/MF$1.45
Atomic Energy Establishment, Winfrith (England).
MATHEMATICAL MODEL OF A VAPOUR COMPRESSION DESALINATION PLANT.
D. C. Guneratne. May 73, 23p
U.S. Sales Only.

Descriptors: (*Desalination, *Flowsheets), (*Distillation, *Mathematical models), (*Computer codes, *V codes), Compression, Design, Evaporation, Flash heating, Vapors.

For abstract, see NSA 28 08, number 20563.

AEEW-R-860/GA PC$4.50/MF$1.45
Atomic Energy Establishment, Winfrith (England).
DISTILLATION DESALINATION PLANTS: SIMPLIFIED MATHEMATICAL MODELS.
D. C. Guneratne. May 73, 48p
U.S. Sales Only.

Descriptors: (*Distillation, *Mathematical models), (*Desalination, *Flowsheets), Compression, Computer codes, Design, Evaporation, Flash heating, Vapors.

For abstract, see NSA 28 08, number 20564.

AEEW-R-861/GA PC$3.25/MF$1.45
Atomic Energy Establishment, Winfrith (England).
MATHEMATICAL MODELING OF THE MULTI-EFFECT EVAPORATION PROCESS FOR SEAWATER DISTILLATION PLANTS.
D. C. Guneratne. May 73, 24p
U.S. Sales Only.

Descriptors: (*Distillation, *Mathematical models), (*Desalination, *Flowsheets), (*Computer codes, *M codes), Design, Evaporation, Flash heating.

For abstract, see NSA 28 08, number 20565.

LA-UR-73-642/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
DISTRIBUTIONS AND ASSOCIATIONS OF SOME OF THE CHEMICAL ELEMENTS FOUND IN THE STRATOSPHERE.
W. A. Sedlacek, and P. R. Guthals. 1972, 4p
CONF-730625-1
Contract AT(29-2)-3139

Descriptors: (*Aerosols, *Mixing), (*Stratosphere, Aerosols), Calcium, Chlorine, Distribution, Earth atmosphere, Iodine, Magnesium, Nitrates, Particle size, Sodium, Sulfates, Troposphere.

For abstract, see NSA 28 07, number 15502.

LBL-1831/GA PC$4.75/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
MASS TRANSFER COEFFICIENT IN PACKED BEDS AT LOW REYNOLDS NUMBERS.
H. H. K. Yip. Jun 73, 55p
Contract W-7405-eng-48

Descriptors: (*Fluidized bed, *Mass transfer), Electrodes, Porosity, Reynolds number, Spheres.

For abstract, see NSA 28 08, number 20627.

ORNL-TM-4209/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
APPLICATION OF MODERN SOLVENT EXTRACTION TECHNIQUES TO THE REMOVAL OF TRACE QUANTITIES OF TOXIC SUBSTANCES FROM INDUSTRIAL EFFLUENTS.
W. S. Groenier. Jul 73, 20p
Contract W-7405-eng-26

Descriptors: (*Waste processing, *Solvent extraction), (*Mercury, Solvent extraction), Amines, Brines, Mixer-settlers.

For abstract, see NSA 28 08, number 20632.

PATENT-3 520 793/GA Not available NTIS
Department of the Navy Washington D C
ELECTROPHORETIC SEPARATOR.
Patent,
Alexander Kolin. Filed 29 Sep 67, patented 14 Jul 70, 5p Rept nos. PAT-APPL-671 894,
Government invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Electrophoresis), (*Electrophoresis, Separation), Sedimentation.
Identifiers: PAT-CL-204-299, Separators, Columns(Process engineering).

The patent discloses an improvement for an electrophoretic separator of the type wherein particles dissolved or suspended in a fluid are separated by subjecting the fluid to a combined action of a longitudinal electric field traversed by a perpendicular magnetic field within a horizontally extending migration column. The improvement employs a noncircular migration column, shaped like the belt of a belt sander, which overcomes particle sedimentation problems.

PATENT-3 763 055/GA Not available NTIS
Department of the Interior, Washington, D.C.
MICROPOROUS SUPPORT FOR REVERSE OSMOSIS MEMBRANES.
Patent,
Leroy A. White, Bernard O. Baum, William H. Holley, and Harold E. Podall. Filed 7 Jul 71, patented 2 Oct 73, 3p PAT-APL-160 573, DOCKET/SAL-1769
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Membranes), (*Osmosis, Membranes), (*Membranes, *Supports), Microporosity, Vinyl chloride resins, Vinyl ether resins, Thermoplastic resins, Polypropylene, Surfactants.
Identifiers: PAT-CL-260-2-5-M, *Membrane supports, Reverse osmosis.

The patent describes a microporous support structure for reverse osmosis membranes. It is prepared by compounding (1) a water-insoluble thermoplastic resin from the group consisting of polyvinyl chloride, vinyl chloride-propylene copolymer and a blend of polyvinyl chloride and vinyl chloride-propylene copolymer, (2) polyvinyl methyl ether and (3) a surfactant, forming the resulting composition into a suitable shape and extracting with water to remove a substantial portion of the polyvinyl methyl ether and surfactant, thereby forming a microporous structure.

PATENT-3 763 830/GA Not available NTIS
Department of the Interior, Washington, D.C.
APPARATUS FOR BURNING SULFUR CONTAINING FUELS.
Patent,
Ernest B. Robinson, Shelton Ehrlich, and John W. Bishop. Filed 24 Jan 73, patented 9 Oct 73, 9p
FAT-APPL-315 445, DOCKET/OCR-1644/2099
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Air pollution control equipment), (*Air pollution, Sulfur dioxide), (*Sulfur dioxide, Chemisorption), Fluidized bed processors, Calcium oxides, Regeneration(Engineering), Coal, Furnaces, Flue gases, Combustion, Calcium carbonates, Boilers, Limestone.
Identifiers: PAT-CL-122-4-D, Air pollution control, Limestone injection.

The patent describes a combustion apparatus for the removal of sulfur oxides from fuels containing sulfur. A first and a second fluidized bed boiler having heat exchange surfaces, that burn the sulfur fuels are positioned adjacent each other with the second bed having less heat exchange surface than the first. Each bed has solid particulate sulfur acceptors that are circulated between the two beds. Heat exchange wall members between the beds semi-isolate them from each other such that there is little or no mixing of the gaseous combustion products from each boiler. The end result is the gas emitted to the atmosphere from the beds after additional processing is depleted in sulfur oxides.

PB-224 424/2GA PC$5.25/MF$1.45
Aerospace Crop., El Segundo, Calif. Urban Programs Div.
INVESTIGATION OF SURFACE COMBUSTION CONCEPTS FOR NOX CONTROL IN UTILITY BOILERS AND STATIONARY GAS TURBINES.
Final rept.,
W. U. Roessler, E. K. Weinberg, J. A. Drake, H. M. White, and T. Iura. Aug 73, 180p* ATR 73(7286)-2 EPA-650/2-73-014
Grant EPA-R-801490

Descriptors: (*Combustion, *Surface properties), (*Combustion chambers, Surface properties), Catalysis, Reviews, Gas turbines, Boilers, Air pollution, Heat transfer, Burners, Exhaust gases, Cool flames, Nitrogen oxides.
Identifiers: *Surface combustion, Air pollution abatement.

The report reviews the state of the art of concepts of surface combustion (that occurring near a solid surface) and assesses their applicability to large utility boilers and stationary gas turbines. Catalytic combustion looks promising for gas turbines. However, comprehensive experimental and theoretical investigations are required for a meaningful assessment. Catalytic combustion is not considered feasible for existing steam boilers, but might apply to newly designed units. Sintered metal porous-plate combustors with imbedded cooling tubes (a non-catalytic concept), although technically feasible for steam boilers and possibly for low-pressure ratio gas turbines, has packaging problems and requires gaseous and distillate fuels. (Modified author abstract)

PB-224 767/4GA PC$9.00/MF$1.45
Oak Ridge National Lab., Tenn.
CALCIUM SULFATE SCALING IN REVERSE OSMOSIS (HYPER-FILTRATION) OF BRACKISH WATERS BY HOLLOW-FIBER AND SPIRAL-WOUND MODULES.
Research and development progress rept.,
Robert E. Minturn. Oct 73, 136p Int-OSW-RDPR-73-897
Contract DI-14-30-2535

Descriptors: (*Osmosis, Membranes), (*Scaling, *Membranes), (*Calcium sulfates, Scaling), (*Aqueous electrolytes, Osmosis), Desalting, Reviews, Polarization(Charge separation), Brackish water, Thermodynamics, Precipitation(Chemistry).
Identifiers: Hollow fiber membranes, Spiral wound membranes, Reverse osmosis desalination, *Concentration polarization.

The primary objective of the study was to operate hollow-fiber and spiral-wound modules in reverse osmosis of synthetic waters in order to establish a correlation between the practical solubility limits of calcium sulfate as a function of operating conditions and the equilibrium solubility limits that were determined in concurrent work. A subsidiary objective was to organize existing literature data on the free energies of solutions of electrolytes common in natural waters in a manner allowing convenient estimation of osmotic pressures. The results of the experimental program directed to reverse osmosis tests of commercial modules are given in Section two of this report, thermodynamic data and procedures for its use are presented in Section three, and a theoretical discussion of concentration polarization in multicomponent systems is presented in Section four. (Modified author abstract).

TT-71-53074/GA PC$3.00/MF$1.45
Bureau of Mines, Washington, D.C.
THE BEHAVIOR OF MINERAL COMPONENTS OF SOLID FUEL DURING COMBUSTION,
A. Z. Yurovskii. 1972, 13p
Trans. of All-Union Conference on the Combustion of Solid Fuels (3rd) Novosibirsk, Oct 69. Proceedings, n.p., n.d., v2 p59-66, by Geti Saad. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Combustion deposits, *Coal), Oxides, Slags, Ashes, Cyclone separators, Beneficiation, Separation, USSR, Translations.

The translation briefly discusses the distribution and separation of mineral components of solid fuels during furnace combustion generally for purposes of recovery and beneficiation.

7B. Inorganic Chemistry

AD-768 515/9GA Reprint
Georgetown Univ Washington D C Dept of Chemistry
TUNGSTOVANADATE HETEROPOLY COMPLEXES. IV. VANADIUM(IV) COMPLEXES,
Charles M. Flynn Jr., and Michael T. Pope. 15 Nov 72, 11p AFOSR-TR-73-1819
Grant AF-AFOSR-1833-70
See also report dated 26 Oct 71, AD-752 298.
Availability: Pub. in Inorganic Chemistry, v12 n7 p1626-1634 1973.

Descriptors: (*Tungstates, Synthesis(Chemistry)), (*Vanadates, Synthesis(Chemistry)), Spectra(Infrared), Spectra(Visible + ultroviolet), Electron spin resonance, X-ray diffraction analysis, Complex compounds, Salts, Molecular structure, Crystal structure.
Identifiers: *Tungstovanadates.

Three tungstovanadate (IV) heteropoly anions have been isolated as several crystalline salts and characterized by elemental analysis, chemical reaction studies, X-ray diffraction, and infrared, optical, and esr spectroscopy. Pinkish purple V(iv)W5O19(4-) (stable at pH 5-6) and brown-orange HnV(iv)2W4O19(-6+n) (stable at pH 7-8) appear to possess the Lindqvist-Aronsson Nb6O19(8-)-type structure. Dull wine red H2W11V(iv)O40(8-) is stable at pH 4-7; the data point to a keggin structure related to metatungstate. The optical spectra show the three complexes to be analogs of heteropoly blue species, with low-energy intervalence charge transfer as well as the expected d-d transitions. The chemical reactions of the complexes are schematized. A new preparation of metatungstate is also described. (Author)

AD-768 622/3GA PC$3.50/MF$1.45
Eagle-Picher Industries Inc Miami Okla Miami Research Labs
PREPARATION AND STUDY OF HIGH PURITY BORON-GROUP FIVE COMPOUNDS.
Final rept. 1 Nov 71-30 Jun 73,
J. T. Buford, R. I. Gross, and J. A. Reising. 31 Jul 73, 58p* AFCRL-TR-73-0484
Contract F19628-72-C-0087

Descriptors: (*Boron compounds, Synthesis(Chemistry)), Compacting, Antimony alloys, Crystal structure, X-ray diffraction analysis, Impurities, Phosphides, Bromides, Arsenides.
Identifiers: Antimonides, Group 5A compounds.

The report summarizes the results of a twenty month study of various compounds of boron with the group five elements phosphorus, arsenic, and antimony. Methods of preparation of high purity boron phosphide, boron subphosphide, and boron subarsenide were used to produce these compounds for further study, while boron arsenide was produced only as a mixture with large amounts of boron, assumed to be free or unreacted. X-ray studies of boron phosphide and boron arsenide were performed to determine if and to what degree the compounds produced in this study exhibited the ideal ordered zincblende structure. The results for boron arsenide show closer agreement with theoretical predictions than previous studies. Dense compacts of vapor deposited boron phosphide were formed as samples for window material studies. A feasibility study of the preparation of boron antimonide in 100 gram quantities determined that such a process is apparently not feasible. (Modified author abstract)

AD-768 624/9GA PC$3.00/MF$1.45
Aerodyne Research Inc Burlington Mass
EVALUATION OF ATMOSPHERIC RELEASE TECHNIQUES FOR ATOMIC URANIUM AND THORIUM.
Interim technical rept. 23 Jan-23 Jun 73,
M. Camac, C. E. Kolb, B. W. Worster, R. C. Sepucha, and F. Bien. Jun 73, 42p Rept no. ARI-RR-23 RADC-TR-73-285
Contract F30602-73-C-0162, ARPA Order-1649

Descriptors: (*Uranium, Vaporization), (*Thorium, Vaporization), (*Uranium compounds, Physical properties), (*Thorium compounds, Physical properties), Atomization, Exploding wires, Vapor pressure, Vapors, Atoms, Metalorganic compounds, Melting point, Sublimation, Thermal stability, Boiling point, Heaters, Upper atmosphere, Atmospheric sounding.
Identifiers: Volatility, *Chemical release studies.

Because certain simple uranium and thorium oxides exhibit ionization potentials which are lower than their metal-oxygen bond strengths their low temperature and pressure chemistry can result in the production of stable ionized species. Release of uranium or thorium vapor in the presence of ambient atomic and molecular oxygen in the upper atmosphere may result in the formation of stable ionic metal clouds which extend over large volumes. Radar and optical observation of these clouds could yield information about upper atmospheric properties. This report reviews a number of techniques for the release of U and Th which may be adaptable to field experimental conditions. The techniques reviewed include the release of volatile compounds containing U and Th, evaporation by chemical and electrical heating, and exploding wires. (Author)

AD-769 036/5GA Not available NTIS
National Research Council of Canada Halifax (Nova Scotia) Atlantic Regional Lab
TRIMETHYLSILYL DERIVATIVES FOR THE STUDY OF SILICATE STRUCTURES. PART III: SODIUM SILICATE HYDRATES,
Santosh K. Sharma, Lesley S. Dent Glasser, and Charles R. Masson. 11 Dec 72, 7p
Prepared in cooperation with Aberdeen Univ. (Scotland). Dept. of Chemistry. See also Part 2, AD-726 240.
Availability: Pub. in Jnl. of Chemical Society, Dalton Transactions, p1324-1328 1973.

Descriptors: (*Silicates, Molecular structure), Gas chromatography, Chemical reactions, Hydrates, Silanes, Minerals, Canada.
Identifiers: *Hemimorphite.

A study was made of the yield and distribution of the products formed when Na2H2SiO4,4H2O,Na2H2SiO4,5H2O, and Na2H2SiO4,8H2O were treated by a direct method of trimethylsilylation reported previously. These soluble silicates are particularly prone to side reactions due to polymerisation of silicate ions in solution, yielding a distribution of products many of which are undetected chromatographically. Quantative yields of the expected orthosilicate derivatives were obtained only when vanishingly small concentrations of silicate were used. Further experiments with the mineral hemimorphite confirmed that, for a unified method of trimethylsilylation applicable to different structures, careful control of the water content in the reaction medium is essential. Improvements in the trimethylsilylation and chromatographic procedures are described. (Author)

CEA-CONF-2247/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
TRACE ANALYSIS USING ION ABRASION TECHNIQUES AND NUCLEAR REACTIONS.
M. Bruel, and E. Ligeon. Sep 72, 11p CONF-720990-5
In French. U.S. Sales Only.

Descriptors: (*Boron, *Nuclear reaction analysis), (*Phosphorus, Nuclear reaction analysis), (*Silicon, Nuclear reaction analysis), (*Zinc compounds, Nuclear reaction analysis), Abrasion, Depth, Ion beams, Sputtering, Surfaces, Tellurides.

For abstract, see NSA 28 07, number 15177.

CEA-CONF-2307/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
AMERICIUM CHALCOGENIDES (SULPHIDES AND SELENIDES).
D. Damien, and R. Berger. 9p CONF-711078-1
U.S. Sales Only.

Descriptors: (*Americium sulfides, *Crystal structure), (*Americium compounds, Crystal structure), Chemical preparation, Decomposition, Lattice parameters, Molecular structure, Selenides.

For abstract, see NSA 28 07, number 15371.

CNEA-340/GA PC$3.00/MF$1.45
Comision Nacional de Energia Atomica, Buenos Aires (Argentina).

DETERMINATION OF THORIUM BY ISOTOPIC DILUTION.
A. A. Suner, A. M. L. G. de Batistoni, J. Botbol, and R. Aprile. 1973, 18p
In Spanish. U.S. Sales Only.

Descriptors: (*Thorium, *Isotope dilution), Ion exchange, Quantitative chemical analysis, Spectrophotometry, Thorin, Thorium complexes.

For abstract, see NSA 28 08, number 17873.

FRNC-TH-287/GA PC$5.45/MF$1.45
Paris Univ. (France).
DETERMINATION OF C, N, AND O USING EXP 12 C(ALPHA ,N) EXP 15 O, EXP 14 N(D,N) EXP 15 O, AND EXP 16 O(GAMMA ,N) EXP 15 O NUCLEAR REACTIONS.
F. Mayolet. 1972, 86p
In French. U.S. Sales Only.

Descriptors: (*Oxygen, *Activation analysis), (*Silicon, Activation analysis), (*Steels, Activation analysis), (*Tantalum, Activation analysis), Multi-element separation, Nuclear reactions, Quantitative chemical analysis, Sensitivity, Copper, Gamma radiation, Lead, Mev range 10-100, Molybdenum, Photon beams, Alpha beams, Carbon, Interfering elements, Iron, Deuteron beams, Mev range 01-10, Nitrogen.

For abstract, see NSA 28 08, number 17852.

JAERI-M-5097/GA PC$4.00/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
ISOTOPE DILUTION METHOD FOR THE DETERMINATION OF MERCURY IN AN INDUSTRIAL ELECTROLYTIC CELL.
Jan 73, 35p
In Japanese. U.S. Sales Only.

Descriptors: (*Mercury, *Isotope dilution), Accuracy, Electrolysis, Errors, Measuring methods, Mercury 197, Mercury 203, Quantitative chemical analysis, Radioactivity, Sample preparation.

For abstract, see NSA 28 08, number 17874.

LBL-1832/GA PC$3.50/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
VAPORIZATION STUDIES OF STRONTIUM SULFATE.
L. M. Fuke. Jun 73, 26p
Contract W-7405-eng-48

Descriptors: (*Strontium sulfates, *Evaporation), Dissociation heat, Enthalpy, Entropy, Equilibrium, Vapor pressure, Very high temperature.

For abstract, see NSA 28 08, number 20628.

N73-30107/9GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IDENTIFICATION OF A NEW LITHIUM OXIDE, LI3O2.
S. Stecura. Sep 73, 12p NASA-TM-X-2888, E-7381

Descriptors: *Decomposition, *Lithium hydroxides, *Lithium oxides, High vacuum, Lattice parameters, Nickel, Niobium, Tantalum, Temperature gradients.

For abstract, see STAR 1121

N73-31033/6GA PC$7.75/MF$1.45
Technische Hogeschool, Delft (Netherlands).
RCO5 AND RELATED SYSTEMS.
Ph.D. Thesis.
F. A. Kuijpers. 20 Jun 73, 113p

Descriptors: *Crystal structure, *Gas-metal interactions, *Magnetization, *Thermodynamics, Bibliographies, Cobalt, Hydrogen, Rare earth elements.

For abstract, see STAR 1122

N73-31035/1GA PC$3.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
INTERACTION OF TITANIUM NITRIDES WITH OXYGEN AND CARBON DIOXIDE.
Y. G. Gurevich, Y. K. Semenov, and V. I. Yeliseyev. 21 Sep 73, 7p NASA-TT-F-15108
Contract NASW-2483
Tran-Transl. Into English from Izv. Vysshikh Uchebn. Zavedenii, Chernaya Met. (Moscow), No. 4, Apr. 1969 p 10-12.

Descriptors: *Carbon dioxide, *Chemical reactions, *Oxygen, *Titanium nitrides, Nitrous oxides, Oxidation, Reaction kinetics, Rutile.

For abstract, see STAR 1122

ORO-3621-19/GA PC$3.00/MF$1.45
Texas Agricultural and Mechanical Univ., College Station. Dept. Of Chemistry.
CHELATION AND OLATION REACTIONS OF METAL IONS IN AQUEOUS SOLUTION. FINAL REPORT.
A. E. Martell. 15 Jun 73, 7p
Contract AT(40-1)-3621

Descriptors: (*Chelates, *Research programs), (*Uranium, *Chemical reactions), (*Thorium, Chemical reactions), Aqueous solutions, Calcium complexes, Copper complexes, Nickel complexes, Polymerization, Thorium complexes, Uranium complexes, Uranyl compounds.

For abstract, see NSA 28 07, number 15375.

PB-224 557/9GA PC$3.50/MF$1.45
National Bureau of Standards, Washington, D.C.
COMPARISON OF LABORATORY METHODS FOR DETERMINING LEAD IN DRIED PAINT FILMS, MILESTON REPORT 2B,
Bernard Greifer, S. D. Rasberry, T. C. Rains, E. J. Maienthal, and E. R. Deardorf. Jul 73, 66p* NBS-10966

Descriptors: (*Lead(Metal), Paints), (*Paints, Chemical analysis), (*Chemical analysis, Lead(Metal)), Atomic spectroscopy, Performance evaluation, Cost analysis, Cost estimates, Quantitative analysis, Metal coatings, Spectrochemical analysis, Polarographic analysis, X-ray fluorescence, X-ray analysis, Spot tests, Spectrophotometry.
Identifiers: *Lead based paints, Atomic absorption spectroscopy, X-ray fluorescence analysis, Dithizone analysis.

Four instrumental methods of chemical analysis were evaluated for determining lead in fresh, dried paint films, at concentrations between 0.5 and 2.0 percent by weight: atomic absorption spectrometry, polarography, spectrophotometry (dithizone procedure), and x-ray fluorescence analysis. In addition, a spot test method was examined for ability to discriminate among three levels of lead concentration in the paints: less than one percent; about one percent, and greater than one percent. (Modified author abstract)

PB-224 677/5GA MF$1.45-NTIS
URS Research Co., San Mateo, Calif.
TOXIC MATERIALS ANALYSIS OF STREET SURFACE CONTAMINANTS.
Environmental protection technology series rept., Robert E. Pitt, and Gary Amy. Aug 73, 143p W74-00306, EPA-R2-73-283
Contract DI-14-12-921
Paper copy available from GPO $1.55 as EP1.23/2:73-283.

Descriptors: (*Particles, Spectrochemical analysis), (*Roads, *Trace elements), (*Water pollution, Surface water runoff), Dust, Particle size distribution, Solubility, Toxicity, Metals, Biochemical oxygen demand, Mass spectra, Atomic spectra, Streets, Pavements, Highways, Runways, Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Zinc, Nickel, Mercury, Strontium, Titanium, Zirconium, Organic compounds.
Identifiers: Atomic absorption spectroscopy.

Mass spectrographic analyses were performed on various samples of street surface particulates. Using these results, the heavy metals which were determined to have the greatest water pollution potential (As, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Ni, Sr, Ti, Zn, and Zr) were analyzed in each of about 75 samples collected nationwide in 10 cities. Other analyses conducted included: size affinities of the metals, solubilities and toxicities of the road surface runoff mixture, and certain organic analyses on selected samples. Additional sampling was conducted on rural road, highway and airport surfaces and particulates were analyzed for the following common water pollution parameters: BOD, COD and nutrients, plus selected heavy metals, for comparison with values representative of normal city streets. (Modified author abstract)

PB-224 688/2GA PC$3.00/MF$1.45
National Bureau of Standards, Washington, D.C. Inst. for Applied Technology.
ANALYTICAL METHODS FOR THE DETECTION OF TOXIC ELEMENTS IN DRY PAINT MATRICES. A LITERATURE SURVEY.
Final rept.,
Maya Paabo. Jul 73, 49p* NBSIR-73-251

Descriptors: (*Chemical analysis, *Paints), Cadmium, Mercury, Arsenic, Lead(Metal), Neutron activation analysis, Antimony, Selenium, Colorimetric analysis, Metal coatings, Spectrochemical analysis, Atomic spectroscopy, Reviews, Bibliographies, Gravimetric analysis, Polarographic analysis, Electrolytic analysis, X-ray fluorenscence, Electron probes, X-ray analysis, Spot tests.
Identifiers: *Lead based paints, Atomic absorption spectroscopy, X-ray fluorescence analysis, Voltammetry.

The report is a summary description of the chemical procedures currently available for the analysis of selected toxic elements in dried paint. The elements included are lead, mercury, cadmium, antimony, arsenic, and selenium. The literature search upon which this report is based was directed primarily toward references pertaining to the analysis of dried paint. A bibliography of 57 references to wet chemical analysis, colorimetry, atomic absorption spectroscopy, electrochemistry, neutron activation analysis, and x-ray emission analysis is presented. (Author)

RCN-186/GA PC$8.25/MF$1.45
Reactor Centrum Nederland, Petten.
INVESTIGATIONS ON URANYL CHLORIDE, ITS HYDRATES, AND BASIC SALTS.
G. Prins. May 73, 122p
U.S. Sales Only.

Descriptors: (*Uranyl compounds, *Chemical preparation), Chemical properties, Chlorides, Formation heat, Hydrates, Physical properties, Reviews, Spectra, Stability, Thermodynamic properties.

For abstract, see NSA 28 08, number 18031.

RFP-Trans-138/GA PC$5.25/MF$1.45
Ceskoslovenska Akademie Ved, Rez. Ustav Jaderneho Vyzkumu.
PLUTONIUM HEXAFLUORIDE, ITS PREPARATION AND PROPERTIES.
M. Vanka. 27 Jul 73, 63p
Translation of Fluorid plutoniovy, jeho priprava a vlastnosti, 1970.

Descriptors: (*Plutonium fluorides, *Chemical preparation), Chemical radiation effects, Chemical reactions, Fluorination, Materials handling, Physical properties, Plutonium oxides, Reduction, Reviews, Safety, Separation processes, Uranium hexafluoride.

For abstract, see NSA 28 08, number 18033.

UCRL-74430/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
MEASUREMENT OF THE MASS SPECTROMETER EFFICIENCY IN THE ISOTOPIC ANALYSIS OF VERY SMALL PLUTONIUM SAMPLES.
R. D. Carver, and R. J. Dupzyk. 26 Jun 73, 5p
CONF-730547-2

Descriptors: (*Plutonium 239, *Mass spectroscopy), (*Plutonium 240, Mass spectroscopy), (*Soils, *Chemical analysis), (*Water, Chemical analysis), Efficiency, Isotope ratio, Mass spectrometers, Quantitative chemical analysis, Tissues.

For abstract, see NSA 28 08, number 17876.

7C. Organic Chemistry

AD-768 407/9GA PC$3.00/MF$1.45
Hebrew Univ Jerusalem (Israel)
AMIDES, IMIDES AND POLYMERS BY TRANSACYLATION IN MELTS AND SOLUTIONS.
Final technical rept. Jul 70-30 Jun 73,
Saul Patai. Jun 73, 50p ARDG(E)-E-1581
Contract DAJA37-72-C-4531

Descriptors: (*Esters, *Grignard reactions), (*Carbamic acids, Chemical reactions), (*Halogen compounds, *Hydrogenation), Reaction kinetics, Grignard reagents, Carboxylic acids, Melting, Amides, Imides, Polymers, Israel.
Identifiers: Chemical reaction mechanisms, *Carbonates, *Acylation, Melts.

The study of the reactions of carbamates with carboxylic acids in melts is reported both from the mechanistic/kinetic and synthetic aspects. Three distinct modes of reaction of Grignard reagents with carbamates have been discovered and studied. A mechanistic study of the hydrogenolysis of active halogen compounds is also included. (Author)

AD-768 505/0GA Reprint
Pennsylvania State Univ University Park Dept of Chemistry
REACTIONS OF NICKEL ATOMS WITH UNSATURATED HYDROCARBONS,
P. S. Skell, J. J. Havel, D. L. Williams-Smith, and M. J. McGlinchey. 5 Jun 72, 4p AFOSR-TR-73-1788
Grant AF-AFOSR-1983-71
Availability: Pub. in Jnl. of the Chemical Society Chemical Communications, p1098-1099 1972.

Descriptors: (*Nickel, Chemical reactions), (*Butadienes, Metalorganic compounds), Alkenes, Alkynes, Chemical reactions, Atoms.
Identifiers: *Nickel organic compounds, Chemical reaction mechanisms.

Nickel atoms react with buta-1,3-diene to produce dodeca-2,6,10-triene-1,12-diylnickel; nickel atoms also trimerise acetylenes, dimerise norbornadiene, and isomerise olefins, probably via a pi-allyl hydride mechanism. (Author)

AD-768 517/5GA Reprint
Columbia Univ New York Dept of Chemistry
PHOTOCHEMICAL RING EXPANSION OF CYCLIC ALIPHATIC KETONES. CYCLOBUTANONES AND CYCLOPENTANONES,
Douglas R. Morton, and Nicholas J. Turro. 6 Nov 72, 12p AFOSR-TR-73-1814
Grant AF-AFOSR-1848-70
Availability: Pub. in Jnl. of the American Chemical Society, v95 n12 p3947-3957, 13 Jun 73.

Descriptors: (*Butanones, Photochemistry), (*Pentanones, Photochemistry), Chemical reactions, Ketones, Molecular energy levels, Nuclear magnetic resonance, Spectra(Infrared).
Identifiers: Chemical reaction mechanisms, *Cycloaliphatic ketones, Rearrangement reactions, Quantum efficiency.

The solution phase photochemical transformations of several substituted cyclobutanones and cyclopentanones are described with emphasis placed on the mechanism and scope of the photochemical ring expansion reaction. For cyclobutanone, ring expansion appears to be a singlet state reaction, and the extent to which it occurs is found to depend upon the nature and position of substituents on the four-membered ring. The results can be interpreted in terms of an intermediary oxacarbene in equilibrium with a singlet biradical (Scheme II). For monocyclic cyclopentanones, ring expansion is only observed for spiro(2.4)heptan-4-one (56). Quantum yield and kinetic and product analyses demonstrate that ring expansion is a triplet state reaction. These results suggest that substituents capable of stabilizing the oxacarbene intermediate favor ring expansion. (Modified author abstract)

AD-768 551/4GA Reprint
University of Southern California Los Angeles Dept of Chemistry
REACTION OF DEUTERIUM CHLORIDE WITH CIS- AND TRANS-BETA-TRIMETHYLSILYLSTYRENE,
Karl E. Koenig, and William P. Weber. 8 Dec 72, 6p AFOSR-TR-73-1821
Grant AF-AFOSR-2424-73
Availability: Pub. in Jnl. of the American Chemical Society, v95 p3416-3418 1973.

Descriptors: (*Styrenes, *Stereochemistry), Deuterated compounds, Nuclear magnetic resonance, Chemical reactions, Silanes, Hydrogenation, Chlorides.
Identifiers: *Deuteration, Electrophilic reactions.

The reaction of cis-beta-trimethylsilylstyrene with DCl was shown to yield cis-beta-deuteriostyrene with greater than 95% stereospecificity. Similar trans-beta-trimethylsilylstyrene with DCl was shown to yield pure trans-beta-deuteriostyrene. The mechanism of this reaction is discussed. (Author)

AD-768 634/8GA Reprint
State Univ of New York Buffalo Dept of Psychology
OXIDATIVE COUPLING AS A POTENTIAL ROUTE TO POLYMERS OF GROUP IV ACETYLENES.
Technical rept.,
D. Ray Parnell, and Domenic P. Macaione. 20 Feb 73, 9p Rept no. AMMRC-TR-73-40
Revision of report dated 20 Nov 72.
Availability: Pub. in Jnl. of Polymer Science, v11 p1107-1110 1973.

Descriptors: (*Alkynes, *Polymerization), (*Siloxanes, Polymerization), Oxidation, Silanes, Germanium compounds, Metalorganic compounds, Tin compounds, Catalysis, Copper compounds, Polymers.
Identifiers: Germanium organic compounds, Tin organic compounds.

Bis tert-butyl-, trimethylsilyl- and trimethylgermyl-diacetylenes were prepared from the corresponding ethynyl Group four compounds via oxidative coupling. Bis(trimethylstannyl)diacetylene could not be prepared by oxidative coupling, but was prepared via another technique. Coupling of diethnyldimethylsilane did not lead to the expected polymer, as cleavage of the silicon-ethynyl bond occurred. However, coupling of 1,3-bis(dimethylethynyl)disiloxane did lead to polymer containing alternating diacetylene and disiloxane units. (Author)

AD-768 635/5GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
CATALYTIC DECOMPOSITION OF THE FIRE EXTINGUISHANT BROMOCHLORODIFLUORO METHANE.
Interim rept.,
James K. Musick. 28 Sep 73, 15p Rept no. NRL-7612

Descriptors: (*Halogenated hydrocarbons, Decomposition), Carbon monoxide, Pyrolysis, Catalysts, Fire extinguishers, Bromine compounds, Fluorine compounds, Chlorine compounds, Copper compounds, Manganese compounds, Oxides, Thermal stability.
Identifiers: *Methane/bromo-chloro-difluoro, *Fire extinguishing agents, Haloalkanes, Manganese oxide, Copper oxides.

A study was made of the action of hopcalite catalyst on bromochlorodifluoromethane (CBrClF2) at 600F, both as a single air contaminant and in the presence of carbon monoxide (CO) as a second contaminant. A bench-scale catalytic burner, which simulated the operating conditions used in the catalytic burners of nuclear submarines, was employed to expose the contaminants to the catalyst at concentrations of about 100 ppm. Less than 5% of the influent CBrClF2 was decomposed in passing through the burner. Free chlorine and/or bromine, hydrogen chloride and/or hydrogen bromide, and hydrogen fluoride were detected in the burner exhaust gas to confirm that a small amount of CBrClF2 did decompose. The activity of the catalyst for CBrClF2 was not affected by the presence of CO. The activity of the catalyst for CO was only slightly reduced by the presence of CBrClF2. (Modified author abstract)

AD-768 665/2GA Not available NTIS
Defence Standards Labs Maribyrnong (Australia)
CRYSTAL AND MOLECULAR STRUCTURE OF O-CHLOROBENZYLIDENE MALONONITRILE,
D. A. Williams, and D. A. Wright. 8 May 72, 10p
Availability: Pub. in the Jnl. of Crystal and Molecular Structure, v3 p55-64 1973.

Descriptors: (*Nitriles, Crystal structure), Aromatic compounds, Molecular structure, X-ray diffraction analysis, Australia, CS agents.
Identifiers: *Malononitrile/2'-chlorobenzylidene, Malononitriles.

The crystal structure of o-chlorobenzylidenemalononitrile, C10H5ClN2, has been determined by X-ray crystallographic analysis. The structure was solved by matching an assumed molecular shape to the near-origin peaks of a sharpened vector map, the detail being established by Fourier syntheses. The molecular components, the phenyl and malononitrile groups, are individually planar but mutually tilted. The deviation from planarity is related to steric hindrance between the malononitrile group and the ortho-hydrogen of the phenyl ring. (Modified author abstract)

AD-768 799/9GA PC$2.75/MF$1.45
Illinois Univ Urbana
REACTIONS OF ACTIVATED OLEFINIC AND AROMATIC SYSTEMS WITH CYANIDE ION AND WITH CERTAIN CARBANIONS IN APROTIC SOLVENTS.
Final rept. 28 Apr 65-30 Jun 73,
Harold R. Snyder. 26 Sep 73, 5p AROD-5036:8-C
Grants DA-ARO(D)-31-124-G679, DA-ARO(D)-31-124-G857

Descriptors: (*Cyanides, *Addition reactions), (*Nitriles, Chemical reactions), (*Aromatic compounds, Addition reactions), Ions, Alkenes, Synthesis(Chemistry), Ketones, Anthracenes.
Identifiers: *Carbanions, Nitro compounds.

The report briefly reviews results and publications from a research study on anion attack on conjugated systems. In dipolar aprotic solvents (DMSO, DMF) heavily arylated olefinic compounds having one or more double bonds activated by conjugation with the aromatic systems undergo reversible addition of cyanide ion to give carbanions which can be transformed into other substances, including the products of cyanation and hydrocyanation of the original hydrocarbons. Aromatic nitriles, particularly those containing polynuclear aromatic systems, also undergo addition of cyanide ion in a process which is useful in synthesis, including the synthesis of C-14 labelled nitriles. Aromatic ketones react with cyanide ion similarly but less readily, and aromatic nitro compounds are more reactive than nitriles and can be converted to a number of further transformation products. (Modified author abstract)

AD-768 897/1GA PC$2.75/MF$1.45
California Univ Los Angeles Dept of Chemistry
THE SYNTHESIS OF A TRIMETALLIC METALLOCARBORANE BY POLYHEDRAL EXPANSION.
Technical rept.,
William J. Evans, and M. Frederick Hawthorne. 26 Sep 73, 11p Rept no. TR-53
Contract N00014-69-A-0200-4019

Descriptors: (*Organoboranes, Chemical reactions), (*Metalorganic compounds, Synthesis(Chemistry)), Cobalt compounds, Spectra(Visible + ultraviolet), Nuclear magnetic resonance, Molecular structure, Decomposition.
Identifiers: *Carboranes, Nuclear magnetic resonance(Boron 11), Dicarba-cobaltio-decaborane(9)/cyclopentadienyl-closo, Dicarba-tricobaltio-dodecaborane(9)/tris(cyclopentadienyl)-closo.

The polyhedral expansion of 2,1,6-C5H5CoC2B7H9 afforded the first trimetallic metallocarborane, (c5h5)3co3c2b7h9. Spectra are reported, and structure is discussed in the light of decomposition products.

AD-769 104/1GA PC$3.00/MF$1.45
Horizons Research Inc Cleveland Ohio
PREPARATION OF AN ELASTOMERIC POLY(ARYLOXPHOSPHAZENE) COPOLYMER.
Final rept. 13 Apr-13 Oct 73,
Kenneth A. Reynard, Arthur H. Gerber, and Selwyn H. Rose. Oct 73, 13p
Contract N00024-73-C-5392

Descriptors: (*Fire resistant materials, *Elastomers), (*Phosphonitrile chloride, Copolymerization), (*Organic phosphorus compounds, Fire resistant materials), Synthesis(Chemistry), Thermal insulation, Inorganic polymers, Nitrogen compounds.
Identifiers: Poly(nitrilo-phosphoranylylidene), Poly(nitrilo-phosphoranylylidene/bis(phenoxy)) nitrilo-phosphoranylylidene/bis(ethylpheroxy).

The (C6H5O)2PN-(4-C2H5C6H4O)2PN)n elastomer was prepared in quantities totaling 5 kg for evaluation as a flame-retardant thermal insulation. The copolymers were characterized by low chlorine content (<0.1%), intrinsic viscosities of 1.7 - 2.8 dl/g (benzene 30C) and C6H5O/4-C2H5C6H4O substituent ratios of 1:1. (Author)

COM-73-50846/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
A METHOD FOR DETERMINING THE OPTIMUM PEROXIDE-TO-AMINE RATIO FOR SELF-CURING RESINS.
Final rept.,
R. L. Bowen, and H. Argentar. 1973, 10p
Pub. in Jnl. of Applied Polymer Science, v17 p2213-2222 (1973).

Descriptors: (*Polyacrylates, Polymerization), (*Accelerating agents, *Polymerization), (*Benzoyl peroxide, Polymerization), (*Arylamines, Accelerating agents), Peroxy organic compounds, Tertiary amines.
Identifiers: *Polymerization initiators.

The rate of polymerization of a methacrylate monomer was influenced by the molar ratio of benzoyl peroxide to an aromatic tertiary amine accelerator when the product of the concentrations of these was kept constant. The maximum rate, measured as the minimum gel time, occurred in monomer solutions containing about 1.5 moles of peroxide per mole of amine. The experimental method should be applicable to the evaluation of the optimal ratios of diverse peroxides and amine accelerators.

COM-73-50856/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MECHANISM OF FORMATION OF TRIS(PHENYLHYDRAZONES) ON TREATMENT OF CYCLOHEXANE-1, 3-DIONES WITH PHENYLHYDRAZINE.
Final rept.,
A. J. Fatiadi. 1973, 3p
Pub. in Chemical Industry (Japan) p38-40, 6 Jan 73.

Descriptors: (*Cyclohexanones, Chemical reactions), (*Hydrazones, Chemical reactions), Electron paramagnetic resonance, Free radicals, Ions, Hydrazines.
Identifiers: Chemical reaction mechanisms, Cyclohexane diones.

The e.s.r. studies show that the formation of the 2-oxo-1, 3-bis (phenylhydrazones) and tris (phenylhydrazones) from cyclohexane-1, 3-diones, and of bis (phenylhydrazones) from cyclohexane-1, 2-diones, following treatment with phenylhydrazine in polar solvents most likely proceeds by a concerted process, involving both ionic and free-radical pathways.

COO-1222-57/GA PC$3.75/MF$1.45
Purdue Univ., Lafayette, Ind. Dept. Of Chemistry.
EFFECT OF AN ELECTRIC FIELD ON THE GAS-CHROMATOGRAPHIC PROPERTIES OF CHOLESTERIC LIQUID-CkYSTAL STATIONARY PHASES.
P. J. Taylor, A. O. Ntukogu, S. S. Metcalf, and L. B. Rogers. 1972, 34p
Contract AT(11-1)-1222

Descriptors: (*Carboxylic acid esters, *Gas chromatography), Cholesterol, Electric fields, Liquid crystals, Organic compounds.

For abstract, see NSA 28 07, number 17744.

N73-30730/8GA PC$3.00/MF$1.45
Defence Standards Labs., Maribyrnong (Australia).
THE RAPID DETERMINATION OF DIPHENYLAMINE AND DINITROTOLUENE IN SINGLE BASE PROPELLANTS BY ULTRAVIOLET SPECTROPHOTOMETRY.
R. G. Davidson, and F. D. Mcpherson. May 73, 10p TM-51

Descriptors: *Chemical analysis, *Diphenyl compounds, *Propellants, *Toluene, *Ultraviolet spectrophotometers, Nitrogen compounds, Solvent extraction, Ultraviolet absorption.

For abstract, see STAR 1121

N73-31029/4GA PC$3.75/MF$1.45
Australian Post Office Research Labs., Melbourne.
ANALYSIS OF ANTIOXIDANTS USED IN POLYOLEFINS.
D. T. Miles. Aug 72, 33p REPT-6726
Misc-Original Contains Color Illustrations.

Descriptors: *Alkenes, *Infrared spectrophotometers, *Oxidation, *Polymers, *Thin layer chromatography, Product development, Qualitative analysis, Quantitative analysis.

For abstract, see STAR 1122

N73-31038/5GA PC$3.75/MF$1.45
Institut fuer Chemie der Treibstoffe, Berghausen (West Germany).
SYNTHESIS AND ANALYSIS OF POLY(VINYL-CO-VINYLENE) NITRATES DARSTELLUNG UND UNTERSUCHUNG VON POLY(VINYL-CO-VINYLEN)NITRATEN.
K. M. Bucerius. 18 Sep 72, 33p ICT-7/72
Language in German.

Descriptors: *Nitrates, *Vinyl copolymers, Hydrolysis, Monomers, Nitration, Stabilization.

For abstract, see STAR 1122

PATENT-3 452 103/GA Not available NTIS
Whittaker Corp., Los Angeles, Calif.
FLUOROHYDROXY ETHERS.
Patent.
F. D. Trischler. Patented 24 Jun 69, 2p NASA-CASE-MFS-10507,
Misc-Filed 30 Dec. 1966. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Alkyl compounds, *Fluoro compounds, *Polyether resins, *Polymerization, Chemical reactions, Oxides, Patents.

The preparation of poly(polyfluoroalkyleneglycol) mono (hydroxy polyfluoroalkylene) ethers from fluoroalkylene oxides is described.

PATENT-3 463 761/GA Not available NTIS
Whittaker Corp., Los Angeles, Calif.
POLYURETHANES OF FLUORINE CONTAINING POLYCARBONATES.
Patent.
F. D. Trischler, and J. Hollander. Patented 26 Aug 69, 2p NASA-CASE-MFS-10512,
Misc-Filed 30 Dec. 1966. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Carbonates, *Chemical properties, *Diisocyanates, *Physical properties, *Polyurethane resins, Chemical reactions, Organic materials, Patents, Synthetic resins.

The polyurethane polymer prepared by reacting a hydroxy-terminated carbonate with an organic diisocyanate is examined.

PATENT-3 475 384/GA Not available NTIS
Whittaker Corp., Los Angeles, Calif.
FLUORINE CONTAINING POLYURETHANE.
Patent.
F. D. Trischler. Filed 28 Oct 69, 2p NASA-CASE-MFS-10509,
Misc-Filed 30 Dec. 1966. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Chemical reactions, *Diisocyanates, *Formates, *Polyurethane resins, Hydroxyl compounds, Organic materials, Patents, Synthetic resins.

A polyurethane polymer prepared by reacting a hydroxy-terminated polyformal with an organic diisocyanate is presented.

PATENT-3 499 058/GA Not available NTIS
Department of the Navy Washington D C
MIXTURE OF TWO POLYESTERS WITH PYROMELLITIC DIANHYDRIDE.
Patent,
Martin H. Kaufman. Filed 22 Apr 66, patented 3 Mar 70, 6p Rept nos. PAT-APPL-545 802,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Polyester plastics), (*Polyester plastics, *Crosslinking(Chemistry)), (*Anhydrides, *Copolymerization), Polyamide plastics, Thermosetting plastics, Hardness, Curing agents, Mechanical properties.
Identifiers: PAT-CL-260-860, Benzene tetracarboxylic dianhydride/1-2-4-5.

The patent describes novel polymeric resins prepared from polyesters, polyesteramide and cyclic anhydrides which can be compounded to form products having predetermined physical properties varying from soft and flexible to hard and tough.

PATENT-3 577 356/GA Not available NTIS
Whittaker Corp., Los Angeles, Calif.
HIGHLY FLUORINATED POLYMERS.
Patent.
F. D. Trischler, and J. Hollander. Patented 4 May 71, 2p NASA-CASE-MFS-11492,
Misc-Filed 23 Feb. 1968. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fluoro compounds, *Isopropyl alcohol, *Polyether resins, *Polymerization, Hydroxyl compounds, Patents, Thermal stability.

A description is given of hydroxy containing polyethers which are prepared by the base polymerization of 2-hydro-perhaloisopropyl alcohols having the formula CF3 CH(OH)CH2X, where X is fluorine, chlorine, bromine or iodine.

7D. Physical Chemistry

AAEC/E-255/GA PC$3.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
STRUCTURES OF FLUORIDES. II. THE STRUCTURE OF URANYL FLUORIDE.
J. C. Taylor, and P. W. Wilson. Jan 73, 16p
U.S. Sales Only.

Descriptors: (*Uranyl compounds, *Molecular structure), Crystal models, Layers, Line broadening, Neutron diffraction, Stacking faults, Uranium fluorides.

For abstract, see NSA 28 07, number 15370.

AD-768 371/7GA PC$3.00/MF$1.45
Lockheed Missiles and Space Co Inc Palo Alto Calif Palo Alto Research Lab
SILVER/SILVER CHLORIDE ELECTRODES: SURFACE MORPHOLOGY ON CHARGING AND DISCHARGING.
Technical rept. 26 Apr 73-1 Jul 73,
T. Katan, S. Szpak, and Douglas N. Bennion. 8 Oct 73, 39p Rept nos. LMSC-D354723, TR-1
Contract N00014-73-C-0397

Descriptors: (*Silver, Electrodeposition), (*Silver compounds, *Electrodeposition), Surface properties, Oxidation, Reduction(Chemistry), Films, Surfaces, Electrodes, Mass transfer, Electron microscopy, Chlorides.
Identifiers: Silver chloride.

Transport modes were determined from examinations of morphology for electrochemical oxidation and reduction within electrodes consisting of beds of silver spheres 37.2 micrometers in diameter in 1 N KCl and subjected to 5.0 mA/sq cm applied current density. Oxidation proceeded via silver dissolution, probably at dislocation sites, followed by diffusion and, then, deposition of AgCl in characteristic, bulbed mounds which grow together to form layers of approximately uniform thickness. AgCl film thickness, for the case of partially covered underlying silver, was about 3,500 Angstroms, and distance from silver dissolution pits to AgCl deposition sites was found to be increased, from 4,000 to 40,000 Angstroms, as the local transfer current density became larger within the sphere bed. Reduction of anodically formed AgCl on partially covered silver proceeded by an opposite path: solution and diffusion of AgCl, and deposition of silver on preferred sites of surrounding bare silver surface. (Author)

AD-768 374/1GA PC$2.75/MF$1.45
Arizona Univ Tucson Dept of Chemistry
IMPROVEMENTS IN FLAME EMISSION SPECTROMETRY THROUGH THE USE OF ULTRASONIC NEBULIZATION INTO A PREMIXED OXYGEN-HYDROGEN FLAME.
Technical rept.,
D. E. Gutzler, and M. B. Denton. Oct 73, 25p Rept no. TR-4
Contract N00014-67-A-0209-0019

Descriptors: (*Ultrasonic radiation, *Atomization), (*Atomic spectroscopy, Flames), Fluorescence, Laminar flow, Turbulence, Oxygen, Hydrogen, Nitrogen oxides, Alkynes, Sensitivity, Chemical analysis, Microanalysis.
Identifiers: Emission spectroscopy, Performance evaluation, Flicker, Spectrochemical analysis, *Flame emission spectroscopy.

A laminar flow premixed oxygen-hydrogen flame when combined with ultrasonic nebulization has improved detection limits approaching three orders of magnitude when compared to a conventional turbulent oxygen-hydrogen flame used in flame emission spectrometry. In a comparison with two other premixed flames, the premixed oxygen-hydrogen flame gave the lowest detection limits for elements with wavelengths longer than 4000 A. The increased sensitivity is attributed to the low flame background emission and reduced flame flicker. (Modified author abstract)

AD-768 426/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
METHOD FOR DETERMINING THE DISPERSED COMPOSITION OF AEROSOLS,
Ya. I. Kogan, R. S. Repina, D. V. Novozhilova, and L. I. Krugman. 10 Oct 73, 10p Rept no. FTD-HT-23-509-74
Edited trans. of Patent (USSR) 285 326 p1-3, 29 Oct 70, by Paul J. Reiff.

Descriptors: (*Aerosols, *Particle size), Patents, USSR.
Identifiers: Translations, *Particle size distribution.

The translated Russian patent briefly describes a method for determining the dispersed composition of aerosols. To increase the accuracy of analysis the average values of particle size are determined by several independent methods with known and considerably different laws of averaging. For example, a way for measuring the average light dispersion, average weight, average diffusion deposition of tagged atoms. The distribution parameters for particle size are calculated according to the degree of divergence of the obtained average values, with consideration of the corresponding averaging laws. (Author)

AD-768 460/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PROCEDURE FOR DISPERSING SOLUTIONS,
L. A. Mirmovich, M. V. Tovbin, and D. F. Datsenko. 9 Oct 73, 14p Rept no. FTD-HT-23-24-74
Edited trans. of Ukrainskii Nauchno-Issledovatelskii Gidrometeorologicheskii Institut. Trudy (USSR) n89 p124-130 1970, by Paul J. Reiff.

Descriptors: (*Aerosol generators, Jet engines), Particle size, Atomization, Fluid flow, Gas flow, USSR, Velocity, Solutions.
Identifiers: Translations, *Dispersing, Atomizers.

The translation studies the laws governing the dispersion of solutions in the gas stream of a jet engine. It was shown that under the test conditions, atomizer design as well as liquid flow rate have little effect on the degree of dispersion of the aerosol produced. The gas stream velocity has an essential effect on the dispersion conditions. A design to obtain an aerosol of the reagent with given particle dimensions was developed.

AD-768 494/7GA Reprint
University Coll Dublin (Ireland) Dept of Chemistry
REACTIONS INVOLVING ELECTRON TRANSFER AT SEMICONDUCTOR SURFACES. III. DISSOCIATION OF METHYL IODIDE OVER ZINC OXIDE,
Joseph Cunningham, and A. L. Penny. 9 Aug 71, 11p AFOSR-TR-73-1780
Grant AF-AFOSR-2148-71
See also report dated 22 Jul 70, AD-725 693.
Availability: Pub. in Jnl. of Physical Chemistry, v76 n17 p2353-2361 1972.

Descriptors: (*Halogenated hydrocarbons, *Dissociation), (*Semiconductors, *Catalysts), (*Zinc compounds, Catalysts), Photolysis, Iodine compounds, Alkanes, Adsorption, Oxides, Methane, Ultraviolet radiation, Electrical conductance, Electron spin resonance, Eire.
Identifiers: *Zinc oxides, Iodoalkanes, *Methane/iodo, Gas surface interactions, Quantum efficiency, Chemical reaction mechanisms.

Gaseous methyl iodide has been observed to undergo dissociation when contacted with semiconducting zinc oxide at 20C in the absence of any illumination. Additional dissociation of methyl iodide was observed at the CH3I-ZnO interface under illumination by ultraviolet light of wavelengths longer than 290 nm. Adsorption obeyed a Langmuir type isotherm and monolayer coverage was closely approached at all methyl iodide pressures > 0.05 Torr. Conductivity and esr studies of zinc oxide layers showed initial electron localization by adsorbed methyl iodide but also revealed a secondary process which slowly returned electrons to the conduction band. The apparent initial quantum efficiency of the photoassisted methane formation is reported, but kinetics of this process, like kinetics of the slow secondary dark reaction, were complex and the mechanisms are not yet fully understood. (Modified author abstract)

AD-768 514/2GA Reprint
George Washington Univ Washington D C Dept of Chemistry
HETEROCONJUGATION OF INORGANIC ANIONS IN NONAQUEOUS SOLVENTS. I. PERCHLORATE AND HALIDE COMPLEXES OF 1,2-DIHYDROXYBENZENE,
Lajos Barcza, and Michael T. Pope. 8 Feb 73, 4p AFOSR-TR-73-1820
Grant AF-AFOSR-1833-70
Availability: Pub. in the Jnl. of Physical Chemistry, v77 n14 p1795-1796 1973.

Descriptors: (*Phenols, *Complex compounds), Perchlorates, Chlorides, Bromides, Iodides, Chemical equilibrium, Stability, Molybdates, Phosphates, Silicates, Nuclear magnetic resonance, Chemical bonds.
Identifiers: *Pyrocatechols.

Heteroconjugates of 1,2-dihydroxybenzene (pyrocatechol) with halide and perchlorate anions in nitromethane solution have been investigated by nmr spectroscopy. The computed formation constants (at 37C) of the 1:1 complexes are reported. It is proposed that the relatively high stabilities are due to chelate type, twin hydrogen bonds between the pyrocatechol and the anions. Although a stability constant could be calculated for the 'inert' perchlorate ion, no interaction could be detected between pyrocatechol and the heteropoly 12-molybdophosphate and 12-molybdosilicate anions. (Modified author abstract)

AD-768 518/3GA Reprint
Wayne State Univ Detroit Mich Dept of Chemistry
ELECTRON-ELECTRON DOUBLE RESONANCE STUDY OF TRAPPED ELECTRONS IN GAMMA-IRRADIATED 2-METHYL-TETRAHYDROFURAN GLASS: MAGNETIC ENERGY TRANSFER BETWEEN TWO DIFFERENT SPIN SYSTEMS,
Hiroshi Yoshida, Da-Fei Feng, and Larry Kevan. 27 Dec 72, 8p AFOSR-TR-73-1823
Grant AF-AFOSR-1852-70, Contract AT(11-1)-2086
Availability: Pub. in Jnl. of Chemical Physics, v58 n11 p4924-4929, 1 Jun 73.

Descriptors: (*Paramagnetic resonance, *Free radicals), Radiation chemistry, Furans, Gamma rays, Cryogenics, Electrons, Electron spin resonance, Relaxation time.
Identifiers: Gamma irradiation, Matrix isolation techniques, *Electron electron double resonance, *Trapped electrons, Furan/methyl-tetrahydro, Energy transfer.

Electron-electron double resonance (ELDOR) of trapped electrons and radicals in gamma-irradiated 2-methyltetrahydrofuran (MTHF) glass at 77 K was investigated. Magnetic energy pumped into the radical spin system is transferred to the trapped electron spin system to partially saturate it. The cross saturation mechanism is consistent with dipolar cross relaxation in which a radical spin flips down and an electron spin flips up. Analysis of the rate of spin relaxation shows that the reciprocal ELDOR reduction is linear with pumping microwave power with an intercept which gives the ratio of the cross-relaxation time to the electron spin-lattice relaxation time. The experimental data are found to fit this relationship. The observation of cross relaxation in this system supports the concept that the trapped electron and radical are spatially correlated. (Modified author abstract)

AD-768 519/1GA Reprint
California Univ Los Angeles Dept of Chemistry
DETECTION OF STEADY-STATE FREE-RADICAL CONCENTRATIONS BY PHOTOIONIZATION,
Ian T. N. Jones, and Kyle D. Bayes. 17 Jun 72, 4p AFOSR-TR-73-1817
Grant AF-AFOSR-1872-70
Availability: Pub. in Jnl. of the American Chemical Society, v94 n19 p6869-6871 Sep 72.

Descriptors: (*Free radicals, Chemical analysis), (*Hydrocarbons, Free radicals), Ionization, Flames, Reaction kinetics, Photochemistry, Mass spectroscopy.
Identifiers: Steady state, Photoionization.

Free radicals have been detected at their steady-state concentrations in various oxygen atom-hydrocarbon flames by photoionization mass spectroscopy. The free radicals observed include CH2, CH3, C2H5, C3H3, C3H7, CHO and HCCO. From the approach of a free radical to its steady state concentration, it is possible to determine the absolute rate constant for the destruction of the free radical. It is proposed that this technique will be of general use in studying free radical kinetics. (Modified author abstract)

AD-768 522/5GA Reprint
Sussex Univ Brighton (England) Chemical Lab
BONDING STUDIES OF COMPOUNDS OF BORON AND THE GROUP IV ELEMENTS. X. PHOTOELECTRON SPECTRA OF COMPOUNDS TETRA METHYL(M=C, SI, GE, SN, OR PB) AND THE LACK OF PARTICIPATION OF M D-ORBITALS,
R. Boschi, M. F. Lappert, J. B. Pedley, W. Schmidt, and B. T. Wilkins. 4 Aug 72, 5p AFOSR-TR-73-1832
Grant AF-AFOSR-2220-72
See also AD-767 777 and AD-768 523.
Availability: Pub. in Jnl. of Organometallic Chemistry, v50 p69-73 1973. Available in microfiche only.

Descriptors: (*Alkanes, Molecular orbitals), (*Silanes, Molecular orbitals), (*Germanium compounds, Molecular orbitals), (*Tin compounds, Molecular orbitals), (*Lead compounds, Molecular orbitals), Molecular energy levels, Chemical bonds, Metalorganic compounds, Ionization potentials, Atomic orbitals, Great Britain.
Identifiers: Group 4A compounds, *Photoelectron spectroscopy.

The question of d-orbital participation by the central metal M in molecules containing second and higher row elements is critically examined in relation to the photoelectron spectra of the Group IV compounds Me4M. It is shown that the splitting between the two strictly symmetry-determined CH levels drops monotonically from 1.3 eV in neopentane to approximately zero in tetramethylplumbane, as is consistent with the decreasing through-space interactions in the (CH3)4 tetrahedron. Within the limits of the spectroscopic resolution, d-orbital participation is therefore discounted, as this would tend to increase the separation between these two levels on going down the series. (Modified author abstract)

AD-768 523/3GA Reprint
Sussex Univ Brighton (England) Chemical Lab
BONDING STUDIES OF COMPOUNDS OF BORON AND THE GROUP IV ELEMENTS. VIII. HEATS OF HYDROLYSIS AND BOND ENERGIES FOR SOME TRIMETHYLMETALYL DERIVATIVES ME 3M-X (M = SI, GE, AND SN),
J. C. Baldwin, M. F. Lappert, J. B. Pedley, and J. S. Poland. 9 Mar 72, 13p AFOSR-TR-73-1833
Grant AF-AFOSR-2220-72
See also AD-768 522.
Availability: Pub. in Jnl. of The Chemical Society, Dalton Transactions, p1943-1947 1972. Available in microfiche only.

Descriptors: (*Silanes, Heat of formation), (*Germanium compounds, Heat of formation), (*Tin compounds, Heat of formation), Hydrolysis, Chemical bonds, Metalorganic compounds, Great Britain.
Identifiers: Group 4A compounds.

The heats of hydrolysis, in aqueous 1M-hydrochloric acid, of one silicon, five germanium, and eight tin(IV) compounds of type (Me3M)nX (where M = Si, Ge, or Sn, n = 1-3, and X is a univalent ligand in which the donor atom adjacent to M is N, O, S, Cl, Br, or I) to give (Me3Si)2O. (Me3Ge)2O, and (Me3SnOH)2 have been measured. From these, standard heats of formation have been calculated. Gas-phase enthalpies of formation of these compounds and thermochemical bond energy terms E(M-X) have been calculated. Group trends show that, for constant X, E(C-X) < E(Si-X) > E(Ge-X) > E(Sn-X), whereas E(C-Y) > E(Si-Y) (Y = H or Me). Another conclusion is that the 'softness' (in terms of heats of formation of reactions) of the acids Me3M(+) increase in the order C < Si < Ge < Sn; several chemical reaction types are examined in this light. (Modified author abstract)

AD-768 529/0GA Reprint
Colorado State Univ Fort Collins Dept of Chemistry
EFFECT OF 2-BUTANOL ON THE ACTIVITY OF SODIUM SULFATE IN AQUEOUS SOLUTIONS. IMPLICATIONS FOR ELECTROSORPTION STUDIES,
David M. Mohilner, and Hisamitsu Nakadomari. 19 Mar 73, 3p AFOSR-TR-73-1816
Grant AF-AFOSR-1887-70
Availability: Pub. in Jnl. of Physical Chemistry, v77 n12 p1594 1973.

Descriptors: (*Sulfates, Electrolytes), (*Butanols, Hydrates), Sorption, Electrochemistry, Concentration(Chemistry).
Identifiers: Activity coefficients.

In studies of the electrosorption of organic compounds on electrodes from aqueous solutions it has been customary to use solutions with varying concentrations of the organic compound but a constant concentration of the electrolyte. This assumes that the activity of the electrolyte is unaffected by the presence of a neutral organic compound. During an investigation of the electrosorption of 2-butanol on mercury from aqueous sodium sulfate solutions this assumption was tested by measuring the activity of the sodium sulfate in the three-component mixtures by the emf method. It was found that for this system at least the assumption is completely untenable.

AD-768 531/6GA Reprint
Arizona Univ Tucson Dept of Physics
THEORY OF OPTICAL FREE INDUCTION DECAY AND TWO-PHOTON SUPERRADIANCE,
Frederic A. Hopf, Robert F. Shea, and Marlan O. Scully. 28 Jan 73, 9p AFOSR-TR-73-1843
Grant AF-AFOSR-1921-70
Availability: Pub. in Physical Review A, v7 n6 p2105-2110 Jun 73.

Descriptors: (*Electron transitions, Relaxation time), Stark effect, Coherent radiation, Raman spectroscopy.
Identifiers: *Superradiance.

The Stark pulse technique of Brewer and Shoemaker allows one to observe phenomena such as optical induction decay, optical nutation, and two-photon superradiance. The authors develop a theoretical treatment of these phenomena under the appropriate experimental conditions. The calculations of the free induction decay and the corresponding optical nutation are shown to be in excellent agreement with experiment. The authors also discuss the two-photon superradiance phenomenon of Brewer and Shoemaker as a Raman effect appearing in first order perturbation theory. The analysis illustrates the essential features of the experimental observation. (Author)

AD-768 535/7GA Reprint
Northwestern Univ Evanston Ill Dept of Physics
COVALENCY, SPIN DENSITIES AND CORE ELECTRON BINDING ENERGY SPLITTINGS IN RARE EARTH ION COMPLEXES,
E. Byrom, D. E. Ellis, and A. J. Freeman. 1973, 7p AFOSR-TR-73-1760
Grant AF-AFOSR-2012-71
Sponsored in part by Atomic Energy Commission, Washington, D.C. and National Science Foundation, Washington, D.C.
Availability: Pub. in Proceedings: Magnetism and Magnetic Materials Annual Conference (18th), Denver, 1972, AIP Conference Proceedings, n10 p1294-1298 1973.

Descriptors: (*Europium compounds, *Molecular orbitals), (*Complex compounds, Molecular orbitals), Fluorides, Rare earth compounds, Ionization potentials, Nuclear spins.
Identifiers: Covalent bonds, Spin orbit interactions, Ligand fields, Form factors.

Results are reported for first principles calculations on the (EuF6)(4-) cluster using the (spin and orbital) Unrestricted Hartree-Fock-Slater Molecu-

lar Orbital Scheme, recently developed to treat transition metal ion complexes. The effects of covalency on spin densities, neutron magnetic form factors, and exchange splitting of one-electron binding energies are described. (Author)

AD-768 536/5GA Reprint
Indian Inst of Tech Kanpur Dept of Physics
PROTON SPIN RELAXATION IN LIQUID 1,2-DICHLOROETHANE,
Anup Kitchlew, and B. D. Nageswara Rao. 16 Oct 72, 6p AFOSR-TR-73-1839
Grant AF-AFOSR-2157-71
Availability: Pub. in the Chemical Physics Letters, v18 n1 p123-125, 1 Jan 73.

Descriptors: (*Halogenated hydrocarbons, Nuclear spins), Relaxation time, Chlorine compounds, Protons, Nuclear magnetic resonance, Diffusion, Dipole moments, India, Theses.
Identifiers: *Spin lattice relaxation, Spin echo spectroscopy, Self diffusion, *Ethane/dichloro.

Proton spin-lattice relaxation time, T1, and coefficient of self-diffusion, D, of 1,2-dichloroethane have been measured in the temperature range 300K to 430K using the spin-echo technique. For the analysis of the T1-data the contribution of the intermolecular dipolar interactions has been separated by using Torrey's formula along with experimentally measured values of D. It has been found that the contributions from the proton-chlorine scalar coupling interaction and from the modulation of the intramolecular dipolar interactions by the rotamer exchange are negligible. The correlation time for molecular reorientation thus determined showed a slow variation with temperature indicating that the reorientation is not diffusional and is most likely to be inertial in character. (Author)

AD-768 542/3GA Reprint
California Univ San Diego La Jolla
VELOCITY DISTRIBUTION MEASUREMENTS OF 0.06-1.4 EV ARGON AND NEON ATOMS SCATTERED FROM THE (111) PLANE OF A SILVER CRYSTAL,
R. B. Subbarao, and D. R. Miller. 18 Jan 72, 14p AFOSR-TR-73-1927
Contracts F44620-68-C-0010, DA-31-124-ARO(D)-257
Availability: Pub. in the Jnl. of Chemical Physics, v58 n12 p5247-5257, 15 Jun 73.

Descriptors: (*Surfaces, Potential scattering), Silver, Argon, Neon, Surfaces, Particle beams, Momentum, Velocity, Single crystals, Atoms.
Identifiers: Momentum transfer, Energy transfer, *Gas surface interactions, Velocity distribution, Angular distributions, Atomic beams.

Velocity distribution and out-of-plane density distribution measurements are reported in detail for 0.6-1.4 eV argon and neon atoms scattered from the (111) plane of single silver crystals. Incident energies were selected to probe the regime of epithermal scattering where significant changes in scattering direction were previously found to occur. Velocity and density distributions are combined and integrated to yield total transfer coefficients. The change in scattering direction is found not to be related to a transition to structure scattering but rather to a decrease in normal momentum transfer as the total scattering becomes more elastic. An anomaly in the direction of energy transfer also appears which suggests that energy may be transferred from the crystal to the gas even though the mean incident energy may be greater than the mean lattice energy. In general the qualitative results of McClure for differential momentum transfer and of Oman for integrated transfer characteristics of the specific argon-silver interaction appear to be substantially correct. (Modified author abstract)

AD-768 544/9GA Reprint
California Univ San Diego La Jolla
PROPERTIES OF 0.01-EV HELIUM ATOMS SCATTERED INELASTICALLY FROM SILVER(111),
R. B. Subbarao, and David R. Miller. 27 Aug 71, 7p AFOSR-TR-73-1930
Contracts F44620-68-C-0010, DA-31-124-(ARO(D)-257
Availability: Pub. in The Jnl. of Vacuum Science and Technology, v9 n2 p808-811 1971.

Descriptors: (*Surfaces, Inelastic scattering), (*Silver, Inelastic scattering), (*Helium, Inelastic scattering), Phonons, Crystals, Alpha bombardment.
Identifiers: *Gas surface interactions.

Out-of-plane density distribution and in-plane velocity distribution measurements for low-energy (0.01-eV) helium scattering inelastically from 550 K silver (111) are presented. The data suggest that surface phonon interactions have a negligible effect on the observed scattering. (Author)

AD-768 550/6GA Reprint
California Univ Los Angeles Dept of Chemistry
ELECTRONIC ENERGY TRANSFER FROM 32(O2)(A SINGLET DELTA G) TO 36(O2)(X TRIPLET SIGMA G(-)),
Ian T. N. Jones, and Kyle D. Bayes. 11 Apr 72, 3p AFOSR-TR-73-1818
Grant AF-AFOSR-1872-70
Availability: Pub. in Jnl. of Chemical Physics, v57 n2 p1003-1004 Jul 72.

Descriptors: (*Oxygen, Molecular energy levels), Isotopes, Electron transitions, Ground state, Excitation.
Identifiers: Energy transfer, Collisional energy transfer, Oxygen isotopes, Molecule molecule interactions.

A kinetic study of the transfer of electronic energy between different isotopic molecules of O2(a singlet Delta) has shown that exchange occurs on almost every collision. Since the optical transition (a singlet Delta) to X triplet Sigma is forbidden, this rapid transfer of electronic energy is not expected using recent theories of energy transfer. (Author)

AD-768 564/7GA Reprint
Texas Univ Austin Dept of Physics
THERMAL DIFFUSE SCATTERING OF LOW-ENERGY ELECTRONS FROM XE,
L. L. Kesmodel, F. W. DeWette, and R. E. Allen. 1 May 72, 11p AFOSR-TR-73-1810
Grant AF-AFOSR-1973-71
Availability: Pub. in the Jnl. of Physical Review B, v7 n2 p802-810 1973.

Descriptors: (*Xenon, Electron diffraction analysis), Solidified gases, Surfaces, Crystal structure, Cryogenics.
Identifiers: *Low energy electron diffraction, Face centered cubic lattices.

One-phonon thermal-diffuse-scattering intensities have been calculated for the (111), (100), and (110) surfaces of Xe. The calculations are based on the (pseudo-) kinematical approximation, which is presumably very good for this material. The finite penetration of the electrons into the crystal is approximately taken into account with a transmission factor. It is important to include the penetration since the assumption of scattering from the surface layer only (made in treatments by other authors) leads to results which are qualitatively incorrect. The present calculations are for extensive regions of reciprocal space including several reciprocal lattice rods. The results are presented in the form of both contour curves and intensity profiles. (Modified author abstract)

AD-768 565/4GA Reprint
Purdue Univ Lafayette Ind Dept of Chemistry
KINETICS AND MECHANISM OF THE OXIDATION OF COBALT (II) AMINOPOLYCARBOXYLATE COMPLEXES BY HYPOBROMOUS ACID AND HYPOBROMITE ION,
W. H. Woodruff, D. W. Margerum, M. J. Milano, H. L. Pardue, and R. E. Santini. 26 Oct 72, 5p AFOSR-TR-73-1815
Grant AF-AFOSR-1988-71
Availability: Pub. in Inorganic Chemistry, v12 n7 p1490-1494 1973.

Descriptors: (*Cobalt compounds, *Reaction kinetics), Chelate compounds, pH, Oxidation, Metalorganic compounds, Bromine compounds.
Identifiers: *Hypobromites, Chemical reaction mechanisms, Cobalt organic compounds.

The oxidation of (Co(II)L)(2-)) (L is ethylenediaminetetraacetate, EDTA(4-), and trans-1,2-diaminocyclohexane-N,N,N',N'-tetraacetate, CyDTA(4-)) by bromine is studied as a function of pH. As the pH is increased, the identity of the kinetically important oxidant changes from a mixture of Br2 and Br3(-) to HOBr and finally to OBr(-). The reactions are first order in (Co(II)L)(2-) concentration and first order in the bromine species. This is a fast process for CyDTA and a rapid scan spectrophotometer is used to observe the oxidation and ring closure steps. (Modified author abstract)

AD-768 566/2GA Reprint
Florida Univ Gainesville Quantum Theory Project
COMPARISON OF TWO STATISTICAL APPROACHES TO CALCULATE ATOMIC AND MOLECULAR ORBITALS,
Poul Jorgensen, and Yngve Ohrn. 26 Feb 73, 10p AFOSR-TR-73-1835
Grant AF-AFOSR-1714-71
Availability: Pub. in the Physical Review A, v8 n1 p112-119 Jul 73.

Descriptors: (*Molecular orbitals, Approximation(Mathematics)), (*Atomic orbitals, Approximation(Mathematics)), Hartree-Fock approximation, Ionization potentials.
Identifiers: Comparison, Slater orbitals.

The Xalpha method for the calculation of atomic and molecular orbitals is compared to a method employing ensemble averages. The formal theory as well as calculated results are discussed and the choice of alpha parameter values for the local exchange approximation is commented upon. (Author)

AD-768 575/3GA Reprint
Kent State Univ Ohio Liquid Crystal Inst
AN EPR STUDY OF A SMECTIC C LIQUID CRYSTAL: A NEW METHOD FOR DETERMINING THE TILT ANGLE,
Edward Gelerinter, and George C. Fryburg. 26 Oct 70, 6p AFOSR-TR-73-1826
Contract F44620-69-C-0021
Prepared in cooperation with Lewis Research Center, Cleveland, Ohio.
Availability: Pub. in Applied Physics Letters, v18 n3 p84-86 1 Feb 71.

Descriptors: (*Liquids, *Crystal structure), (*Benzenes, Crystal structure), Paramagnetic resonance, Line spectrum, Doping, Vanadium compounds, Probes.
Identifiers: *Liquid crystals, Smectic phase, Orientation, Azoxybenzene/bis(heptyloxy), Azoxybenzenes, Vanadium organic compounds.

The authors have aligned the liquid crystal molecules of 4,4'-di-n-heptyloxyazoxybenzene in the smectic C mesophase by means of a magnetic field. With the aid of a paramagnetic probe, the authors have studied the effect of rotation of the aligned sample in the magnetic field of the EPR spectrometer. Interpretation of the results enables them to determine the tilt angle of the liquid crystal, and to predict that smectic C liquid crystals would not lend themselves to NMR orientation studies because of molecular reorientations. (Modified author abstract)

AD-768 583/7GA Reprint
Stanford Univ Calif Inst of Theoretical Physics
ENERGY BARRIER FOR ELECTRON PENETRATION INTO HELIUM,
L. L. Tankersley. 14 Nov 72, 23p Rept no. ITP-421-29R AFOSR-TR-73-1790
Contract F44620-71-C-0044
Availability: Pub. in the Jnl. of Low-Temperature Physics, v11 n3/4 p451-471 1973.

Descriptors: (*Electrons, Penetration), (*Helium group gases, Penetration), Helium, Neon, Argon, Liquefied gases, Surface properties, Potential scattering, Green's function, Approximation(Mathematics).
Identifiers: *Liquid helium, *Atom electron interactions, Helium 3, Helium 4.

The Galitskii approach to the calculation of self-energies is used to find the energy barrier opposing the penetration of electrons into He, Ne, and Ar. Typical barrier energies for 4He and 3He are reported. (Modified author abstract)

AD-768 589/4GA Reprint
Texas Univ Austin Electronics Research Center
NOTE ON SIGNAL-TO-NOISE RATIOS FOR ION AND METASTABLE DETECTION OF NEUTRAL MOLECULAR BEAMS,
Frank G. Collins. 11 Jan 73, 5p AFOSR-TR-73-1776
Contract F44620-71-C-0091
Revision of report dated 29 Sep 72.
Availability: Pub. in The Review of Scientific Instruments, v44 n5 p647-649 May 73.

Descriptors: (*Molecular beams, Signal-to-noise ratio), Electron multipliers, Experimental design, Ionization, Excitation, Detection.
Identifiers: Metastable molecules, Metastable state, Cross sections.

Signal/Noise (S/N) ratios for ion and metastable detection of neutral molecular beams which use time integrated measurements of an electron multiplier output are discussed. It is shown that the excitation probability is considerably less than the ionization probability for most molecules causing S/N improvements with metastable detection to be less than previously expected. An additional decrease results from the low electron yield of the metastable molecule compared to the ion at the electron multiplier surface. (Author)

AD-768 593/6GA Reprint
Chicago Univ Ill James Franck Inst
INTRAMOLECULAR VIBRATIONAL ENERGY TRANSFER: A STUDY OF REPRESENTATIONS,
Stuart A. Rice, and Kenneth G. Kay. 9 Jan 73, 11p AFOSR-TR-73-1824
Contract F44620-72-C-0003
Prepared in cooperation with Kansas State Univ., Manhattan. Dept. of Chemistry.
Availability: Pub. in Jnl. of Chemical Physics, v58 n11 p4852-4862, 1 Jun 73.

Descriptors: (*Polyatomic molecules, Molecular energy levels), Chemical bonds, Quantum mechanics.
Identifiers: *Energy transfer, Vibrational energy levels, *Molecular vibration.

The paper reports a study of possible representations for the description of intramolecular energy transfer. The ultimate goal is the definition of a scheme suitable to the description of a molecule undergoing dissociation which is valid everywhere along the reaction path. Three sets of basis functions for dynamical calculations of intramolecular vibrational energy transfer are studied in one-dimensional, bound or metastable, triatomic molecules having one harmonic and one Morse bond. The different sets result from different definitions of bond coordinates and different methods for separating the bond motions. The relative merits of the basis functions depend strongly on the masses of the atoms and the harmonic frequencies of the bond. The weak energy-dependence of the basis sets is explained in terms of a strong dependence of the optimal bond coordinates upon the interatomic distances. (Modified author abstract)

AD-768 595/1GA PC$6.00/MF$1.45
New York Univ N Y Magneto-Fluid Dynamics Div
LONG-RANGE CORRELATIONS IN KINETIC THEORY,
Chelluri C. A. Sastri. Oct 73, 79p Rept no. MF-72 AFOSR-TR-73-1238
Grant AF-AFOSR-2053-71

Descriptors: (*Kinetic theory, *Fluids), Gases, Interactions, Turbulence.
Identifiers: *Molecule molecule interactions, Boltzmann equation, Correlations, Fluid dynamics, Rarefied gases.

It is shown that macroscopic correlations in a fluid are conserved for macroscoptically long times. The equations of conservation can be written in a form independent of the density of the fluid and are therefore valid for a liquid as well as a gas. For the purpose of describing correlations in a rarefied gas, a generalization of the Boltzmann equation is suggested which not only gives the correct macroscopic correlation equations but satisfies certain compatibility criteria. (Author)

AD-768 605/8GA Reprint
Rockwell International Corp Thousand Oaks Calif Science Center
SURFACE STATES AND CATALYSIS ON D-BAND PEROVSKITES,
F. J. Morin, and T. Wolfram. 26 Mar 73, 5p AFOSR-TR-73-1944
Contract F44620-72-C-0050
Availability: Pub. in Physical Review Letters, v30 n24 p1214-1217, 11 Jun 73.

Descriptors: (*Chemisorption, *Catalysis), (*Band theory of solids, Surfaces), Catalysts, Titanates, Permanganates, Atomic orbitals.
Identifiers: Density of states, Conduction bands, *Perovskites, Potassium tantalates, *Surface chemistry.

It is demonstrated that surface states derived from the lower conduction band of d-band perovskites produce a square-root singularity peak in the density of surface states at energies which lie in the forbidden gap. These surface states are highly localized and have nearly pure d-state character. It is suggested that these surface states provide the necessary orbitals to facilitate an important class of symmetry-forbidden chemical reactions. (Author)

AD-768 652/0GA PC$5.50/MF$1.45
Bell Aerospace Co Buffalo N Y
ANALYTICAL MODELING OF LIQUID AND SOLID PARTICLE EROSION.
Summary rept. Jun 72-May 73,
William F. Adler. Jul 73, 201p AFML-TR-73-174
Contract F33615-71-C-1528

Descriptors: (*Erosion, Particles), Mathematical models, Glass, Composite materials, Reinforced plastics, Brittleness, Metal coatings, Nickel, Polyethylene plastics, Drops, Impact tests, Rain, Sand.
Identifiers: Carbon fiber reinforced plastics.

The analytical model for the erosion of a brittle material by multiple particle impacts is revised in accordance with microscopic observations of the erosion damage due to the direct impact of glass beads. Procedures are described for obtaining the quantitative data required to make the model a predictive tool. Erosion tests were conducted in the AFML-Bell erosion facility using 70 and 290 micron diameter glass beads and uniformly-graded quartz sand impacting flat-faced specimens or borosilicate glass directly and at an oblique angle. Excellent agreement was found between the average ring fracture diameter and the diameter of the contact area predicted by the Hertzian theory of impact for the glass bead impacts. The damage mechanisms for glass plates impacted by sand particles and liquid drops were investigated through microscopic examination of the progressively-eroded surfaces. Weight-loss data are available for ultra-high molecular weight polyethylene, nickel-coated glass-fiber reinforced epoxy, and graphite-fiber reinforced epoxy specimens exposed to rain and sand erosion environments. (Modified author abstract)

AD-768 655/3GA PC$2.75/MF$1.45
Intelcom Rad Tech San Diego Calif
LOW ENERGY ATOMIC COLLISIONS.
Final scientific rept. 1 Jul 70-30 Jun 73,
Roy H. Neynaber. 1 Aug 73, 8p Rept no. RT-8004-002 AFOSR-TR-73-1829
Contract F44620-70-C-0096

Descriptors: (*Molecular beams, *Ionization), Ion beams, Molecular energy levels, Diatomic molecules, Ions.
Identifiers: Ion molecule interactions, Collisional energy transfer, *Collision cross sections, Vibrational energy levels, Atomic collisions, Atom molecule interactions.

A brief review of experimental studies of selected chemi-ionization and ion-molecule reactions conducted in the period 1 July 1970 - 30 June 1973 is presented. Measurements were made using either crossed or merging molecular beams. The reactants included ground and metastable helium, H2, H2(+), H, HeH(+), metastable Ne, and Ar. Measurements of absolute and relative cross sections as well as laboratory energy distributions of product ions were obtained. The studies were made to gain a better understanding of the dynamics of low-energy atomic collisions and to attempt to define the role played by the kinetic and internal energy of reactants. Results are compared with known theories such as those involving the Langevin and spectator-stripping models and cases are indicated where no existing theory is applicable. A list of papers is included. (Modified author abstract)

AD-768 701/5GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
CHARACTERISTICS OF THE ADSORPTION OF NORMAL ALIPHATIC ACIDS BY SILICA GEL FORM,
Etal A. Zeliznyi. 7 Aug 73, 10p Rept no. FSTC-HT-23-1990-72
Trans. of Ukrainskii Khimicheskii Zhurnal (USSR) v37 n4 p337-342 1971.

Descriptors: (*Fatty acids, *Adsorption), (*Silica gel, Adsorption), Organic solvents, USSR.
Identifiers: Translations, Heptane, Adsorption isotherms.

The adsorption characteristics of n-fatty acids during their adsorption on silica gels from n-heptane solutions was studied, and compared with results using carbon tetrachloride and benzene. Results of the investigation show that the distribution of the adsorption isotherms is in accordance with the inverse Traube rule. The amount of adsorption under otherwise like conditions depends on the nature of the solvent.

AD-768 775/9GA PC$2.75/MF$1.45
Picatinny Arsenal Dover N J
OPTICAL ABSORPTION OF TNT SINGLE CYRSTALS.
Technical rept.,
David S. Downs, and Arthur C. Forsyth. Aug 73, 23p Rept no. PA-TR-4565

Descriptors: (*TNT, *Spectra(Visible + ultraviolet)), (*Crystal growth, TNT), Single crystals, Optical properties.
Identifiers: Spectrum analysis, Dichroism.

A method for growing large area, thin, single crystal platelets of TNT is reported. The optical absorption properties of these crystals were studied, and dichroic behavior was observed. The absorption edge is approximately 3.1 eV and is tentatively assigned by comparison were solution spectra. (Modified author abstract)

AD-768 835/1GA PC$13.50/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
KINETICS OF ENZYME CATALYSIS,
V. A. Yakovlev. 13 Aug 73, 226p Rept no. FSTC-HT-23-1119-73
Trans. of unidentified Russian article, Moscow, 1965.

Descriptors: (*Catalysis, *Enzymes), (*Reaction kinetics, Enzymes), Catalysts, Enzyme inhibitors, Temperature, USSR, Cholinesterase, Chemical reactions.
Identifiers: Translations.

Kinetics of enzyme catalysis are discussed in the Russian translation. Included are problems of enzyme kinetics, basic concepts of chemical and enzyme kinetics, features of enzyme catalysis and differences from non-enzyme catalysis, kinetic classification of enzymatic reactions, steady-state kinetics of one-way reactions with one substrate, steady-state kinetics of two-way reactions with one substrate and one product, steady-state kinetics of enzymatic reactions with two substrates, kinetics of inhibition of enzymatic reactions, effect of temperature on kinetics of enzymatic reactions, and kinetics of reactions catalyzed by cholinesterases.

AD-768 870/8GA PC$3.75/MF$1.45
American Univ Washington D C Dept of Physics
STUDIES OF MAGNETIC PROPERTIES IN RARE EARTH ALLOYS AT CRYOGENIC TEMPERATURES.
Interim technical rept. Dec 69-Dec 72,
Romeo Segnan, and Daniel M. Sweger. 31 Dec 72, 97p
Contract DAAK02-70-C-0102

Descriptors: (*Mossbauer effect, Dysprosium), (*Dysprosium, Magnetic properties), (*Gadolinium alloys, Magnetic properties), (*Rare earth elements, Magnetic properties), Cryogenics, Alloys, Atomic energy levels, Hyperfine structure, Quadrupole moments, Nuclear spins.
Identifiers: Mossbauer spectroscopy, Dysprosium alloys, Molecular field theory, Magnons.

The research contributes to an understanding of the interactions responsible for the magnetic behavior of rare earth alloys on the atomic level as an essential step in correlating the basic interactions with the bulk properties of such alloys. Nuclear hyperfine magnetic (NHM) and quadrupolar (NHQ) interaction studies were performed using the 161Dy Mossbauer resonance in the magnetic system Dy(x)Gd(1-x). The NHM and NHQ interactions were measured as a function of concentration and temperature up to the Neel (Curie) points. The data for internal field strengths are compared to existing molecular field and spin-wave theories. (Modified author abstract)

AD-768 912/8GA PC$3.00/MF$1.45
Illinois Univ Urbana Dept of Chemistry
STUDY OF RATE OF NONEQUILIBRIUM DECOMPOSITION OF ENERGETIC MOLECULES.
Annual technical rept. no. 1, Jun 72-Jun 73,
R. A. Marcus. Aug 73, 47p
Contract DAAA21-72-C-0679

Descriptors: (*Relaxation time, *Molecular energy levels), (*Dissociation, Statistical analysis), Quantum mechanics, Excitation, Reaction kinetics.
Identifiers: Energy transfer, Vibrational energy levels, Molecular vibration, Collisional energy transfer, RRKM theory.

During the initiation of an explosion and subsequent reaction, molecules can acquire energy by a variety of mechanisms. The manner in which these molecules assimilate this energy will determine their subsequent behavior. A study on energy redistribution within a molecule is initiated in the present report. Different cases in which a statistical or a dynamical theory is preferable for treating the rate of decomposition of molecules caused by chemical or thermal activation are described. Experimental evidence is considered from this point of view. Current studies on the dynamical treatment of classical, quantum and semiclassical methods are summarized. (Modified author abstract)

AD-768 918/5GA PC$3.00/MF$1.45
Hydronautics Inc Laurel Md
THE PROPERTIES OF WATER IN POLYMERIC MEMBRANES.
Final technical rept. 15 Aug 69-14 Aug 73,
M. A. Frommer, M. Shporer, and G. Herscovici.
Sep 73, 47p Rept no. TR-7001-4
Contract N00014-70-C-0018

Descriptors: (*Cellulose acetates, Membranes), (*Water, Absorption(Physical)), (*Membranes, Absorption(Physical)), (*Cellulose esters, Membranes), Nuclear magnetic resonance, Magnetic properties, Adsorption.
Identifiers: Magnetic susceptibility.

The properties of water in various cellulose acetate (CA) membranes have been investigated by magnetic resonance techniques. The data suggest existence in the CA membrane, of two 'types' of water: a small fraction of highly immobilized 'bound' water and the remaining large fraction of 'free' water. The NMR spectra of water adsorbed at various relative humidities on various cellulose ester membranes also have been studied. Membranes of cellulose acetate, triacetate and acetate-butyrate were investigated. The data suggest that the dependence of the position of the resonance peak on the position of the membrane plane with respect to the external magnetic field, is a geometrical phenomenon due to the magnetic 'bulk susceptibility' of the medium. (Modified author abstract)

AD-768 925/0GA PC$3.50/MF$1.45
Atlantic Research Corp Alexandria Va
METAL OXIDATION IN A VACUUM TANK.
Final technical rept. 1 Jan-1 Jun 73,
Andrej Macek. Jul 73, 26p RADC-TR-73-281
Contract F30602-72-C-0426, ARPA Order-1649

Descriptors: (*Aluminum, Oxidation), Uranium, Vaporization, Vapor pressure, Electron transitions, Molecular energy levels, Aluminum compounds, Oxides, Fluorescence, Atmospheric sounding.
Identifiers: Aluminum oxides, Vibrational energy levels, Spectrum analysis, Emission spectra, *Chemical release studies.

Experiments were performed by a technique in which the metal is vaporized from an electrically heated container made of tantalum or tungsten. This technique was demonstrated to be efficient for quantitative metal-release studies. Eleven releases of aluminum into air have been made with metal-vapor flow rates of the order of 50 mg/sec at heater temperatures of 2400K, over the high-altitude chamber pressures from 13.6 to 0.2 Torr (35 to 60km altitude). All these releases generated visible luminosity, ascribed to the doublet B to doublet X AlO band spectrum. An approximate analysis of the spectral intensities indicates formation of AlO in the ground vibrational state, probably by the rapid reaction Al + O2 to AlO + O. Chemiluminescence caused by active species (O,O3) is not indicated. Attempts to demonstrate release of uranium were unsuccessful. (Modified author abstract)

AD-768 964/9GA PC$3.50/MF$1.45
Arizona Univ Tucson Dept of Physics
STUDIES IN BEAM-FOIL SPECTROSCOPY.
Final rept. 1 Sep 69-31 Aug 72,
Stanley Bashkin. Nov 73, 26p ARL-73-0168
Contract F33615-70-C-1007

Descriptors: (*Foils, Particle beams), (*Atomic spectroscopy, *Particle beams), Atomic energy levels, Stark effect, Zeeman effect, Doppler effect, Spectra(Visible + ultraviolet), Ions, X-ray spectroscopy, Scientific research, Astrophysics.
Identifiers: *Beam foil spectroscopy, Atomic beams.

The report descusses research in beam-foil spectroscopy. Specific illustrations are given of the contributions the project made to the excitation of spectral lines, the construction of energy-level diagrams, the measurements of level mean lives and Lande g-values, production of soft x-rays, Stark and Zeeman effects, applications to astrophysics, technical improvements, and the stimulation of beam-foil and related research in other laboratories. Both experimental and theoretical advances are summarized. (Modified author abstract)

AD-768 981/3GA PC$3.00/MF$1.45
Avco Everett Research Lab Inc Everett Mass
MULTIPLE ELECTRON SCATTERING THROUGH A SLAB.
Research rept.,
J. H. Jacob. May 73, 41p Rept no. AERL-RR-385
Contract N00014-70-C-0427

Descriptors: (*Statistical mechanics, Electrons), Electron density, Distribution functions, Partial differential equations, Graphics.
Identifiers: *Electron scattering, Spherical harmonics, Scattering cross sections.

The transport equation for electron scattering through plane parallel targets has been solved by expanding the electron distribution function into spherical harmonics. The electron energy is assumed to be constant. No simplifying assumptions have been made concerning the scattering cross-sections. In fact, a simple technique has been found for accurately determining the screening angle which plays an important role in multiple scattering. For small angles (= or < 10 degrees) and thin targets, the emerging electron distribution agrees well with earlier theories. However, for larger angles the present theory predicts a greater probability of scattering than earlier theoreis. For thin targets it is well known that the earlier theories emerge with the single scattering distribution function at large angles. This difference at large angles between the present and earlier theories implies implies that the electron distribution predicted by the present calculations will not merge with the single scattering distribution. For thick targets, as one would expect, the earlier theories are poor approximations of the emergent electron distribution function of all angles. (Author)

AD-769 011/8GA Not available NTIS
Waterloo Univ (Ontario) Dept of Chemistry
STUDY OF ELECTRON CAPTURE BEHAVIOR OF SUBSTITUTED AROMATICS BY PLASMA CHROMATOGRAPHY,
Francis W. Karasek, Oswald S. Tatone, and David M. Kane. 30 Jan 73, 6p
Revision of report dated 31 Oct 72.
Availability: Pub. in Analytical Chemistry, v45 n7 p1210-1214 Jun 73.

Descriptors: (*Aromatic compounds, *Electron capture), (*Chromatographic analysis, *Plasma medium), (*Halogenated hydrocarbons, Electron

capture), (*Dissociation, Electron capture), Diffusion, Benzenes, Toluenes, Ionization, Chlorine compounds, Fluorine compounds, Bromine compounds, Iodine compounds, Canada.
Identifiers: *Plasma chromatography, Biphenyl.

The plasma chromatograph can observe experimentally the positive and negative charged species present in the electron capture detector and measure their response and mobility under changing parameters. Experimental evidence of dissociative electron capture is shown for halogenated aromatics with formation of a halogen ion. Aromatics with two different halogen atoms dissociate only the most reactive halogen ion in the order I > Br > Cl. Simple electron attachment with formation of a negative molecular ion occurs for nitrobenzene. Chloronitrobenzene and decachlorobiphenyl undergo both associative and dissociative electron capture. (Author)

AD-769 026/6GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
CHARGE-CONSERVING INTEGRAL APPROXIMATIONS FOR AB INITIO QUANTUM CHEMISTRY.
Journal article,
Douglas L. Wilhite, and Robert N. Euwema. 7 May 73, 7p Rept no. ARL-73-0152

Descriptors: (*Molecular orbitals, Approximation(Mathematics)), (*Ethylenes, Molecular orbitals), (*Glycines, Molecular orbitals), Quantum mechanics, Integrals, Electron density.
Identifiers: Quantum chemistry.

The present theoretical investigation studies the effect of small multilobed initial deviations from the exact shape upon the deformations and the critical time of a thin-walled circular cylindrical shell which was manufactured with initial axisymmetric deformations. To facilitate the analytical work, the actual solid wall of the shell is imagined to be replaced by an equivalent sandwich wall. The general equilibrium equations derived for shallow shells are expressed in terms of stresses and devitations corresponding to the equivalent sandwich model. The radial displacement as well as the meridional, circumferential and membrane shear stresses are expressed by finite Fourier series for each face of the sandwich model. The compatability conditions used in conjunction with the equilibrium equations lead to a system of linear and nonlinear equations. (Modified author abstract)

AD-769 029/0GA Not available NTIS
Dalhousie Univ Halifax (Nova Scotia) Dept of Chemistry
GAS PHASE REACTIONS OF FLUORINE ATOMS,
Thomas Long Pollock, and William Ernest Jones. 27 Dec 72, 9p DRB-Reprint-3828
Availability: Pub. in Canadian Jnl. of Chemistry, v51 n12 p2041-2046 1973.

Descriptors: (*Fluorine, Reaction kinetics), Phosphine, Ammonia, Chemical reactions, Chemiluminescence, Photochemistry, Methane, Halogenated hydrocarbons, Fluorine compounds, Bromine compounds, Chlorine compounds, Atoms, Nitrogen oxides, Canada.
Identifiers: Fluorine atoms, Photometry, Nitrogen oxide(NO), Fluoroalkanes.

The rate of reaction of F atoms with a series of compounds, CH4, CH3F, CH2F2, CHF3, CHClF2, HCl, CBrF3, NH3, and PH3 has been determined relative to the chemiluminescent reaction F + NO + Ar to FNO* + Ar to FNO + Ar + hv by photometry. The fluorine atoms were produced in a flow system from the fluid mixing of molecular fluorine and nitric oxide diluted with argon. (Author)

AECL-4365/GA PC$3.00/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
METHOD FOR THE DETERMINATION OF STRONTIUM-90 AND CESIUM-137 IN RIVER SEDIMENTS AND SOILS.
W. E. Grummitt, and G. Lahaie. Mar 73, 15p
U.S. Sales Only.

Descriptors: (*Strontium 90, *Beta spectroscopy), (*Cesium 137, Beta spectroscopy), (*Sediments, *Radiometric analysis), (*Soils, Radiometric analysis), Errors.

For abstract, see NSA 28 07, number 15232.

AECL-4516/GA PC$3.25/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
PROCESS OF REWETTING A HOT SURFACE BY A FALLING LIQUID FILM.
T. S. Thompson. Jun 73, 24p
U.S. Sales Only.

Descriptors: (*Zircaloy, *Wettability), (*Stainless steels, Wettability), (*Liquids, Stainless steels), Heat transfer, Liquid drop model, Pressure dependence, Surfaces, Temperature dependence.

For abstract, see NSA 28 08, number 18157.

AEEW-M-1027/GA PC$3.50/MF$1.45
Atomic Energy Establishment, Winfrith (England).
QUENCHING OF A HEATED ZIRCALOY SURFACE BY A FILM OF WATER IN A STEAM ENVIRONMENT AT PRESSURES UP TO 53 BAR.
D. F. Elliott, and P. W. Rose. Aug 71, 29p
U.S. Sales Only.

Descriptors: (*Zircaloy-2, *Wettability), (*Water, Zircaloy-2), Films, Heat transfer, Heating, Medium pressure, Pressure dependence, Quenching, Steam, Surfaces, Temperature dependence.

For abstract, see NSA 28 08, number 18158.

ANL-8014/GA PC$4.00/MF$1.45
Argonne National Lab., Ill.
EIGHTEENTH ANNUAL CONFERENCE ON BIOASSAY, ENVIRONMENTAL, AND ANALYTICAL CHEMISTRY, OAK BROOK TERRACE, ILLINOIS, OCTOBER 10--11, 1972. PROGRAM AND ABSTRACTS.
1972, 39p CONF-721096-
Contract W-31-109-eng-38

Descriptors: (*Chemical analysis, *Meetings), Bioassay, Environment.

For abstract, see NSA 28 07, number 15176.

BNL-17948/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
ADSORBED HELIUM FILM: TWO-DIMENSIONALITY VERSUS REALITY.
A. D. Novaco. 1973, 10p CONF-730635-1

Descriptors: (*Helium, *Adsorption), Films, Graphite, Thickness, Two-dimensional calculations.

For abstract, see NSA 28 08, number 20604.

CEA-R-4387/GA PC$8.25/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
STUDY OF VACANCY ELIMINATION IN CHEMICAL DIFFUSION AND ELECTROMIGRATION.
C. Monty. Jun 73, 124p
In French. U.S. Sales Only.

Descriptors: (*Gold alloys, *Vacancies), (*Silver alloys, Vacancies), (*Metals, Vacancies), Diffusion, Electrophoresis, Kirkendall effect, Precipitation.

For abstract, see NSA 28 07, number 17730.

CEA-R-4450/GA PC$9.25/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
DISTRIBUTION OF METALLIC ELEMENT COMPLEXES BETWEEN AN ANION EXCHANGE RESIN AND WATER--METHANOL--HYDROCHLORIC ACID MIXTURES.
M. Rastoix. Jun 73, 141p
In French. U.S. Sales Only.

Descriptors: (*Uranium, *Ion exchange), (*Cadmium, Ion exchange), Anions, Cadmium complexes, Chlorides, Ethanol, Hydrochloric acid, Methanol, Separation processes, Uranyl compounds, Water.

For abstract, see NSA 28 08, number 17926.

CNRS-CPT-73-P-522/GA PC$3.00/MF$1.45
Centre National de la Recherche Scientifique, Marseilles (France). Centre de Physique Theorique.
RECOIL CORRECTIONS TO THE MUONIC ATOM ENERGY LEVELS.
D. A. Owen, J. Calmet, and R. C. Barrett. Mar 73, 6p
U.S. Sales Only.

Descriptors: (*Lead 206, Muonic atoms), (*Muonic atoms, *Energy levels), Binding energy, Corrections, Distribution, Electric charges, Mass, Nuclear potential, Recoils, Two-body problem, Vacuum polarization.

For abstract, see NSA 28 08, number 19444.

COM-73-11851/5GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Aeronomy Lab.
A CRITIQUE OF THE TERM VALUE APPROACH TO DETERMINING MOLECULAR CONSTANTS FROM THE SPECTRA OF DIATOMIC MOLECULES,
D. L. Albritton, W. J. Harrop, A. L. Schmeltekopf, R. N. Zare, and E. L. Crow. 12 Sep 72, 23p NOAA-73092703
Prepared in cooperation with Columbia Univ., New York. Dept. of Chemistry, and Institute of Telecommunication Sciences, Boulder, Colo. Sponsored in part by National Science Foundation, Washington, D.C.
Pub. in Jnl. of Molecular Spectroscopy, v46 n1 p67-88 Apr 73.

Descriptors: (*Line spectra, *Spectrum analysis), (*Molecular spectra, Spectrum analysis), Molecular energy levels, Diatomic molecules, Data reduction.

This paper considers the two commonly used alternatives to the use of combination differences to reduce line position measurements. Section II examines the details of fitting the observed line positions directly to expressions for the energy levels that contain the upper and lower state molecular constants as unknown parameters. Section III considers the two-step procedure that introduces a set of intermediate unknowns, the term values for the upper and lower state rotational levels. The closing section contrasts the term value approach to the direct approach and examines the relative strengths and weaknesses with the aid of examples of singlet systems.

COM-73-11852/3GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Environmental Research Labs.

A DIRECT APPROACH FOR THE REDUCTION OF DIATOMIC SPECTRA TO MOLECULAR CONSTANTS FOR THE CONSTRUCTION OF RKR POTENTIALS,
A. L. Schmeltekopf, W. J. Harrop, D. L. Albritton, and R. N. Zare. 12 Sep 72, 31p NOAA-73092701
Sponsored in part by National Science Foundation, Washington, D.C. Prepared in cooperation with Columbia Univ., New York. Dept. of Chemistry.
Pub. in Jnl. of Molecular Spectroscopy, v46 n1 p37-66 Apr 73.

Descriptors: (*Molecular spectra, *Spectrum analysis), Diatomic molecules, Data reduction, Molecular energy levels, Line spectra, Wave functions, Spin orbit interactions.
Identifiers: Spin spin interactions, *Rydberg-Klein-Rees potential.

A nonlinear fitting procedure is presented that employs all measured line positions and iteratively compares their values with those calculated from numerically diagonalized model Hamiltonians with adjustable molecular constants. Case (a) wavefunctions with definite parity are introduced as a convenient basis set, and the effects of spin-orbit, spin-spin, spin-rotation, and centrifugal distortion interactions neglected in the Born-Oppenheimer separation are included simultaneously using the Van Vleck transformation. The spectroscopic constants found by this procedure represent the minimum-variance, unbiased set and maintain, to a high degree of accuracy, the separate mechanical and magnetic meanings of the molecular constants. Arguments are presented that such spectroscopic constants with mechanical meaning allow the most accurate construction of potential energy functions using the Rydberg-Klein-Rees (RKR) procedure. Residual mechanical and magnetic ambiguities, such as engendered by Lambda-type doubling, are discussed. (Author)

COM-73-50848/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE CONCEPT OF THE SURFACE MOLECULE IN CHEMISORPTION.
Final rept.,
David R. Penn. 1973, 8p
Pub. in Surface Science (Netherlands) v39 p333-340 1973.

Descriptors: (*Chemisorption, Intermolecular forces), Chemical bonds, Surface properties, Band structure of solids, Adsorption, Models.

Under certain circumstances the binding of an adsorbate to a metal surface may be thought of as the formation of a surface molecule composed of the adsorbate and the metal. This point of view is reasonable if the metal density of states at the adsorbate resembles that of an atom, i.e. exhibits a small number of well defined peaks as a function of energy. The width of these peaks must be small compared to the metal band width. Within the context of a simple tight binding model for the metal it was found that for an S state adsorbate on W there are certain adsorbate positions for which the surface molecule concept should be valid.

COM-73-50849/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MASS SPECTROMETRIC ANALYSIS OF 1 ATM FLAMES: APPARATUS AND THE CH4 - O2 SYSTEM.
Final rept.,
John W. Hastie. 1973, 8p
Pub. in Combustion and Flame (England) v21 p187-194 1973.

Descriptors: (*Flames, *Mass spectroscopy), (*Methane, Flames), Oxygen, Nitrogen, Free radicals.

A mass spectrometric system is described for the measurement of reactive intermediates in 1 atm flames. The system has been tested on CH4 - O2 and CH4 - O2 - N2 flames and provides for the first time a complete analysis of such flames for species in excess of 10 to the minus fifth power mole fraction concentration.

COM-73-50852/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SEMICLASSICAL THEORY OF SATURATED ABSORPTION IN GASES.
Final rept.,
Jon H. Shirley. 1973, 22p
Pub. in Phys. Rev. A, General Physics, v8 n1 p347-368 Jul 73.

Descriptors: (*Gas lasers, Theory), (*Electromagnetic absorption, Saturation), Resonance.

A three-dimensional theory for the resonant interaction of electromagnetic waves with a gas of two-level atoms is formulated in terms of macroscopic variables. The theory is used to find the steady-state attenuation of a plane wave in the presence of another plane wave running in the opposite direction with different amplitude. Contributions are included from the reflection of the oppositely running wave by an induced standing-wave inhomogeneity in the population inversion of the medium. Correspondence is made with existing gas-laser theories, yielding the formulation of a high-intensity ring-laser theory. Analytic approximations for the coefficients are presented for the Doppler-limit cases of both waves weak, one wave weak, and negligible refection (rate-equation approximation). More-general cases have been calculated numerically. The attenuation coefficients exhibit a Lamb-dip feature.

COM-73-50853/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
DETERMINATION OF ATOMIC LIFETIMES AND ABSOLUTE OSCILLATOR STRENGTHS FOR NEUTRAL AND IONIZED TITANIUM.
Final rept.,
J. R. Roberts, T. Andersen, and G. Sorensen. 1973, 7p
Pub. in Nuclear Instruments and Methods (Netherlands), v110 p119-125 1973.

Descriptors: (*Titanium, Electron transitions), Transition probabilities, Cations.
Identifiers: Oscillator strengths, Beam foil excitation.

Measurements of atomic lifetimes by the beam-foil technique and branching ratios by use of a gas-flow stabilized arc have led to an experimental determination of absolute oscillator strengths of Ti II. Some lifetimes of Ti I, Ti III and Ti IV are also presented.

COM-73-50857/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
VIBRATIONAL ENERGY TRANSFER IN NO.
Interim rept. Oct 72-Jan 73,
John C. Stephenson. 1973, 5p
Contract ARPA Order-891
Pub. in Jnl. of Chemical Physics, v59 n3 p1523-1527 1 Aug 73.

Descriptors: (*Nitrogen oxide(NO), Relaxation time), Molecular vibration, Molecular relaxation, Fluorescence.
Identifiers: Molecule molecule interactions, Collisional energy transfer, Vibration energy levels, Laser induced fluorescence.

Laser-excited vibrational fluorescence measurements have been used to obtain rate constants at room temperature for vibrational relaxation of the v - 1 state of NO in collisions with He, Ar, H2, CO, NO, N2 and CO2. Pulses from a CO2 laser, frequency doubled in a tellurium crystal, provided the excitation source. The rate for the V-V exchange NO(1) + NO(1) to NO(0) + NO(2) was obtained.

COM-73-50859/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
TABULATION OF HYPERFINE SPLITTINGS IN ROTATIONAL F1 AND F2 LEVELS OF THE GROUND VIVRATIONAL STATE OF (12)CH4 FOR J < OR = 20.
Final rept.,
Jon T. Hougen. 1973, 12p
Pub. in Jnl. of Molecular Spectroscopy, v46 n3 p490-501 Jun 73.

Descriptors: (*Methane, *Hyperfine structure), Ground state, Molecular rotation, Molecular energy levels.
Identifiers: Rotational energy levels.

To a good approximation, hyperfine splittings for F1 and F2 rotational levels of the ground vibrational state of (12)CH4 depend linearly on three hyperfine interaction parameters. Coefficients in these linear expressions have been computed in a relatively simple manner and tabulated for levels with 1 < or = 20. The hyperfine pattern for the J - 7 F2(2) level computed from these expressions using values for three hyperfine interaction parameters reported recently agrees well with the pattern obtained from new He-Ne laser measurements on the P(7) F2(2) line of the v3 band of methane.

COM-73-50864/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
NEUTRON ACTIVATION ANALYSIS: APPLICATION TO TRACE ELEMENT ANALYSIS IN BIOLOGICAL AND ENVIRONMENTAL MATERIALS.
Final rept.,
Donald A. Becker, and Philip D. LaFleur. 1971, 7p
Pub. in Annual Conference on Trace Substances in Environmental Health (5th), Missouri Univ., Columbia, p447-453 1971.

Descriptors: (*Trace elements, Neutron activation analysis), (*Leaves(Botany), *Neutron activation analysis), Biology, Manganese, Sodium, Copper, Zinc, Uranium, Separation, Radiochemistry, Nondestructive tests, Destructive tests.

Neutron activation analysis (NAA) has been found useful for trace element analysis of biological and environmental samples. The favorable characteristics of this technique include high sensitivity, wide applicability, great specificity, and reduced contamination and reagent blank problems. The use of this technique for the analysis of several elements (Mn, Na, Cu, Zn, U) in the recently certified NBS Biological Standard Reference Material: Orchard Leaves, is described. Techniques used include both nondestructive analysis and destructive analysis using radiochemical separations. In addition, the analytical results obtained by NAA on the Orchard Leaves, is compared to that obtained by other analytical techniques.

COM-73-50866/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
GROUND STATE ROTATIONAL CONSTANTS FOR (28SI)H3D.
Final rept.,
R. W. Lovejoy, and W. B. Olson. 1972, 2p
Pub. in Jnl. of Chemical Physics, v57 n5 p2224-2225, 1 Sep 72.

Descriptors: (*Silane, *Infrared spectra), Molecular vibration, Ground state, Deuterium compounds, Molecular rotation.

The infrared spectrum of the v1 and v4 stretching vibrations of SiH3D have been recorded with high resolution. The ground state rotational constants have been determined with much greater precision that has previously been reported.

COM-73-50867/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.

ANALYSIS OF PERTURBATIONS IN THE A TRIPLET PI AND A SINGLET PI STATES OF CO.
Final rept.,
R. W. Field, B. G. Wicke, J. D. Simmons, and S. G. Tilford. 1972, 17p
Pub. in Jnl. of Molecular Spectroscopy, v44 n2 p383-399 Nov 72.

Descriptors: (*Carbon monoxide, Molecular energy levels), (*Molecular energy levels, Perturbations), Electron transitions, Molecular vibration.
Identifiers: Configuration interaction method, Vibrational energy levels.

The results of an analysis of perturbations of the CO a triplet Pi and A singlet Pi states provide evidence for the following conclusions: (i)For perturbations between vibronic levels of a given pair of electronic states, the perturbation matrix element is the product of a vibrational factor and a constant electronic factor. (ii)Simple single configuration arguments successfully predict that all the electronic factors for the perturbations between levels of each pair of states can be related to two constants which are joint properties of two electronic configurations.

COM-73-50868/1GA Not available NTIS
National Breau of Standards, Washington, D.C.
FINE STRUCTURE AND PERTURBATION ANALYSIS OF THE A TRIPLET PI STATE OF CO.
Final rept.,
R. W. Field, S. G. Tilford, R. A. Howard, and J. D. Simmons. 1972, 36p
Pub. in Jn. of Molecular Spectroscopy, v44 n2 p347-382 Nov 72.

Descriptors: (*Carbon monoxide, Moleculor energy levels), Absorption spectra, Electron transitions, Perturbation.
Identifiers: Vibrational energy levels.

The Cameron absorption bands of CO have been photographed at high resolution. The analysis of these bands along with a reanalysis of the a triplet Pi state is presented. Deperturbed molecular constants for this state and accurate perturbation parameters for the interactions with nearby states have been determined by a least-squares matrix diagonalization technique. The input data included: (i) earlier measurements from triplet-triplet emission transitions, (ii) the new measurements of the Cameron bands, (iii) rf measurements of a triplet Pi lambda doubling transitions, and (iv) measurements of absorption spectra to the neighboring perturbing states.

COM-73-50875/6GA PC-GPO/MF$1.45-NTIS
Yale Univ., New Haven, Conn. Dept. of Engineering and Applied Science.
RESONANCES IN ELECTRON IMPACT ON ATOMS AND DIATOMIC MOLECULES.
Final rept.,
George J. Schulz. Oct 73, 118p NSRDS-NBS-50
Pub. in Reviews of Modern Physics, v45 n3 p378-486 Jul 73. Library of Congress Catalog no. 73-600302.
Paper copy available from GPO $1.35 as C13.48:50.

Descriptors: (*Electron irradiation, Atoms), (*Electron scattering, *Resonance), Molecular energy levels, Atomic energy levels, Reviews, Electron beams, Cross sections, Anions, Diatomic molecules, Excitation, Ground state, Ionization potentials.
Identifiers: Atom electron interactions, Electron molecule interactions, Electron attachment.

Two reviews are presented on the energies, configuration and other properties of resonances in electron impact on atoms and diatomic molecules. Included are discussions of the experimental methods which are useful for studying resonances and of the results obtained by various investigations. Much of the information is presented in the form of tables and energy level diagrams.

COM-73-50876/4GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Inst. for Materials Research.
FRAME: AN ON-LINE CORRECTION PROCEDURE FOR QUANTITATIVE ELECTRON PROBE MICROANALYSIS.
Final rept.,
Harvey Yakowitz, Robert L. Myklebust, and Kurt F. J. Heinrich. Oct 73, 51p NBS-TN-796
Paper copy available from GPO $0.80 as C13.46:796.

Descriptors: (*Electron probes, *Data processing), (*Computer programs, Electron probes), X ray analysis, FORTRAN, Chemical analysis, Microanalysis, Performance evaluation, Programming manuals.
Identifiers: Microprobe analysis, Minicomputers, On line computers, FRAME computer program, FORTRAN 4 programming language.

A procedure using a mini-computer for on-line correction of x-ray data from electron microprobe analysis has been developed. This program, called FRAME, allows mass fractions to be computed on-line by the ZAF approach. Besides x-ray intensities, the only input data required are the atomic numbers of the elements present, the analytical line being used, and the operating voltage. Other required parameters such as atomic weights and x-ray mass attenuation coefficients are stored or calculated by the program. FRAME is in FORTRAN IV, and requires about 4K of computer core. Results from FRAME are very close to those of COR2, which is considered to be the most accurate program available for quantitative electron probe microanalysis.

COM-73-50882/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
N EUTRON QUASIELASTIC SCATTERING STUDY OF SH(-)REORIENTATION IN THE CUBIC PHASES OF CESIUM AND RUBIDIUM HYDROSULFIDE.
Final rept.,
J. M. Rowe, R. C. Livingston, and J. J. Rush. 1973, 5p
Pub. in Jnl. of Chemical Physics, v58 n12 p5469-5473, 15 Jun 73.

Descriptors: (*Ingoranic sulfides, Crystal structure), (*Molecular rotation, Crystals), (*Crystal structure, Orientation), Inelastic scattering, Neutron scattering, Elastic scattering.
Identifiers: Cesium hydrosulfide, Rubidium hydrosulfide, Hydrogen sulfide radicals.

The orientational disorder of the hydrosulfide ions in CsSH (CsCl phase) and RbSH (NaCl phase) have been investigated by quasielastic neutron scattering with high energy resolution . The experimental results provide a clear demonstration of the theoretically predicted separation of the quasielastic neutron peaks for rotating groups or molecules into unbroadened and broadened components with reflect, respectively, the geometric and time behavior of the rotation. Jump reorientation of the ions between equilibrium directions is established as the dominant mechanism creating the rotational disorder in the hydrosulfides, and both small-step rotational diffusion and quasifree rotation are clearly ruled out. Average residence times between reorientation jumps are derived from camparisons of the experimental results with theoretical calculations based on jump reorientation models, but it is not possible to determine the equilibrium orientations of the SH(-) ions. Mean-square vibrational amplitudes for the hydrogen atoms are also obtained from the observed integrated intensities of the elastic peaks. The present results are compared in detail with previous lower-resolution neutron results on NaSH and CsSH. It is concluded that in most cases measurements using single crystals will be necessary to establish the details of orientational disorder in solids.

COM-73-50884/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
NEUTRON SCATTERING INVESTIGATION OF THE ROTATIONAL DYNAMICS AND PHASE TRANSITIONS IN SODIUM AND CESIUM HYDROSULFIDES.
Final rept.,
J. J. Rush, L. A. deGraaf, and R. C. Livingston. 1973, 10p
Pub. in Jnl. of Chemical Physics, v58 n8 p3439-3448, 15 Apr 73.

Descriptors: (*Inorganic sulfides, *Crystal symmetry), (*Molecular rotation, Crystals), Crystal structure, Inelastic scattering, Phase transformations, Relaxation time, Neutron scattering, Neutron irradiation, Orientation, Librations.
Identifiers: Hydrogen sulfide radical, Sodium hydrosulfide, Cesium hydrosulfide.

The rotational motions of the hydrosulfide ions in the trigonal and fcc phases of NaSH and in the pseudo-bcc (CsCl) phase of CsSH have been studied by quasielastic and inelastic neutron scattering. NaSH and CsSH are members of a broad group of compounds which have cubic symmetry in the solid phase just below the melting point and a lower symmetry in lower temperature crystal phases. The measured inelastic neutron spectra above and below the trigonal to cubic phase transition in NaSH show that SH(-) ion 'librations' about equilibrium orientations persist in passing through the transition. The experimental quasielastic scattering results are compared with theoretical calculations of quasielastic scattering behavior based on the assumption of instantaneous reorientational jumps between a limited number of quasiequilibrium orientations. An isotropic reorientation model is ruled out, and the differences in the rotational disorder in NaSH and CsSH are discussed. Relaxation times for the SH(-) motions are derived from the theoretical analysis.

COO-3126-21/GA PC$3.00/MF$1.45
Brooklyn Coll., N. Y. Dept. Of Chemistry.
PROGRESS REPORT FOR THE PERIOD JUNE 1, 1972--MAY 31, 1973.
H. L. Finston. 20p
Contract AT(11-1)-3126

Descriptors: (*Neutron reactions, *Cross sections), (*Mercury, *Activation analysis), (*Biological materials, Activation analysis), (*Solvent extraction, *Research programs), Neutron beams, Aqueous solutions, Flour, Quantitative chemical analysis, Standards, Trace amounts, Nickel 58, Nuclear reactions, Radioisotopes, Thermal neutrons, Westcott cross sections.

For abstract, see NSA 28 08, number 17851.

COO-3212-10/GA PC$7.75/MF$1.45
State Univ. Of New York, Buffalo (Usa). Dept. Of Physics. Roswell Park Memorial Inst., Buffalo, N. Y. Dept. Of Biophysics.
ANNUAL PROGRESS REPORT, APRIL 1973.
H. C. Box. 1973, 112p
Contract AT(11-1)-3212

Descriptors: (*Spectrometers, *Design), (*Radiation chemistry, *Research programs), Leading abstract, Nuclear magnetic resonance.

For abstract, see NSA 28 08, number 17983.

COO-3498-9/GA PC$3.00/MF$1.45
Rochester Univ., N. Y.
FUNDAMENTAL STUDIES IN ISOTOPE CHEMISTRY. PROGRESS REPORT, 1 JULY 1972--30 JUN 1973.
J. Bigeleisen, and T. H. Harris. 10p
Contract AT(11-1)-3498

Descriptors: (*Isotope effects, *Research programs), (*Carbon 13, Isotope effects), (*Oxygen 18, Isotope effects), (*Nitrogen 15, Isotope effects), Carbon dioxide, Gases, Labelled compounds, Liquids, Solids, Vapor pressure, Vapors.

For abstract, see NSA 28 07, number 15276.

DNPL/R-24/GA PC$12.75/MF$1.45
Daresbury Nuclear Physics Lab. (England).
SYNCHROTRON RADIATION: A BIBLIOGRAPHY.
G. V. Marr, I. H. Munro, and J. C. C. Sharp. 1972, 211p
U.S. Sales Only.

Descriptors: (*Synchrotron radiation, *Bibliographies), Astrophysics, Atoms, Calibration standards, Molecules, Monochromators, Plasma, Polarized beams, Radiation detectors, Radiation sources, Reviews, Solids, Spectrometers, Spectroscopy, Storage rings, Synchrotrons, X-ray diffraction.

For abstract, see NSA 28 07, number 16503.

IRI-133-72-11/GA PC$3.25/MF$1.45
Interuniversitair Reactor Instituut, Delft (Netherlands).
PATTERN RECOGNITION AS A STATISTICAL METHOD FOR ANALYZING THE CONFIDENCE LEVEL IN THE IDENTIFICATION OF OBJECTS.
M. de Bruin, P. J. M. Korthoven, R. P. W. Duin, F. C. A. Groen, and C. C. Bakels. 1972, 21p
U.S. Sales Only.

Descriptors: (*Crime detection, Activation analysis), (*Activation analysis, *Statistics), Archaeological specimens, Biological materials, Distribution, Minerals, Neutron beams, Neutron reactions, Nondestructive analysis, Nuclear reactions.

For abstract, see NSA 28 08, number 17853.

IS-T-583/GA PC$10.00/MF$1.45
Ames Lab., Iowa.
HIGH TEMPERATURE HEAT CONTENT OF SELECTED RARE EARTH METALS BY LEVITATION CALORIMETRY.
L. A. Stretz. May 73, 157p
Contract W-7405-eng-82

Descriptors: (*Yttrium, *Enthalpy), (*Lanthanum, Enthalpy), (*Praseodymium, Enthalpy), (*Neodymium, Enthalpy), Calibration, Calorimeters, Corrections, Levitation, Melting, Temperature dependence, Very high temperature.

For abstract, see NSA 28 08, number 18750.

JAERI-M-5053/GA PC$5.45/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
PHASE DIAGRAMS AND THE DATA FOR LIQUID METALS AND INORGANIC MOLTEN SALTS: ALKALIFLUOROBORATES RBF SUB 4 (R = LI, NA, K, RB, AND CS).
H. Ohno, and K. Furukawa. Nov 72, 57p
In Japanese. U.S. Sales Only.

Descriptors: (*Fluoroborates, *Physical properties), (*Lithium fluorides, Physical properties), (*Sodium fluorides, Physical properties), (*Potassium fluorides, Physical properties), Bibliographies, Binary mixtures, Cesium fluorides, Complexes, Crystal structure, Density, Dissociation, Electric conductivity, Enthalpy, Infrared spectra, Phase diagrams, Raman effect, Rubidium fluorides, Solubility, Specific heat, Viscosity.

For abstract, see NSA 28 08, number 17945.

LA-UR-73-769/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
VAPORIZATION BEHAVIOR OF THE ZIRCONIUM--URANIUM--CARBON SYSTEM.
E. K. Storms. 1973, 16p CONF-730909-1
Contract W-7405-eng-36

Descriptors: (*Zirconium carbides, *Evaporation), (*Uranium carbides, Evaporation), Binding energy, Chemical composition, Equations, Mixing, Mixtures, Quantity ratio, Temperature dependence, Thermodynamic properties, Vapor pressure, Vaporization heat, Very high temperature.

For abstract, see NSA 28 07, number 15844.

LBL-1427/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
PARTIAL AVERAGING IN CLASSICAL S-MATRIX THEORY; VIBRATIONAL EXCITATION OF H SUB 2 BY HE.
W. H. Miller, and A. W. Raczkowski. Apr 73, 15p
CONF-730452-1
Contract W-7405-eng-48

Descriptors: (*Helium, *Collisions), (*Hydrogen, *Atom collisions), Boundary conditions, Coordinates, Excitation, Linear momentum, Molecules, Phase space, S matrix, Vibrational states.

For abstract, see NSA 28 08, number 19449.

LBL-1820/GA PC$20.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
BEAM STUDY OF NE EXP + AND O EXP + (EXP 4 S/SUB 3/2/) SCATTERING BY MOLECULAR HYDROGEN ISOTOPES AND HELIUM.
J. S. Winn. Jun 73, 360p
Contract W-7405-eng-48

Descriptors: (*Neon ions, *Collisions), (*Oxygen ions, Collisions), (*Helium, *Ion collisions), (*Hydrogen, Ion collisions), Deuterium, Differential cross sections, Dissociation, Distribution, Excitation, Inelastic scattering, Ion beams, Molecules, Total cross sections, Velocity.

For abstract, see NSA 28 07, number 16449.

N73-30104/6GA PC$3.00/MF$1.45
Communications Research Centre, Ottawa (Ontario).
QUENCHING OF THE FLUORESCENCE OF PR(3 PLUS) IONS IN APROTIC SOLVENTS.
A. Watanabe, and J. G. Chambers. Jul 73, 16p
CRC-TN-657

Descriptors: *Chemical composition, *Extinguishing, *Fluorescence, *Praseodymium, Ion density (Concentration), Liquid lasers, Radiation effects, Wavelengths.

For abstract, see STAR 1121

N73-30106/1GA PC$3.75/MF$1.45
Aeronautical Research Associates of Princeton, Inc., N.J.
THE DEVELOPMENT AND PRELIMINARY APPLICATION OF AN INVARIANT COUPLED DIFFUSION AND CHEMISTRY MODEL.
Final Report.
G. R. Hilst, C. D. Donaldson, M. Teske, R. Contiliano, and J. Freiberg. Sep 73, 83p NASA-CR-2295, REPT-193
Contract NAS1-11433

Descriptors: *Gaseous diffusion, *Reaction kinetics, *Turbulent flow, Air pollution, Aircraft wakes, Chemical reactions, Inhomogeneity.

For abstract, see STAR 1121

N73-30108/7GA PC$3.00/MF$1.45
Rice Univ., Houston, Tex. Dept. of Chemical Engineering.
MOESSBAUER SPECTRA OF FERRITE CATALYSTS USED IN OXIDATIVE DEHYDROGENATION.
W. R. Cares, and J. W. Hightower. 1971, 19p
NASA-CR-133740
Contract NGR-23-005-074

Descriptors: *Catalysts, *Dehydrogenation, *Ferrites, *Mossbauer effect, *Spectroscopy, Copper, Iron, Oxidation, Spectra, Temperature effects.

For abstract, see STAR 1121

N73-30109/5GA PC$4.00/MF$1.45
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
EXTRAPOLATION OF THERMOPHYSICAL PROPERTIES DATA FOR OXYGEN TO HIGH PRESSURES (5000 TO 10,000 PSIA) AT LOW TEMPERATURES (100-600 R).
L. A. Weber. Nov 71, 40p NASA-CR-133858, NBS-10727
NASA ORDER W-13353, Contract NBS PROJ. 2750447

Descriptors: *High pressure, *Low temperature, *Oxygen, *Thermophysical properties, Enthalpy, Entropy, Extrapolation, Permittivity, Prandtl number, Specific heat.

For abstract, see STAR 1121

N73-30111/1GA PC$3.00/MF$1.45
Interuniversitair Reactor Instituut, Delft (Netherlands).
LIGAND EXCHANGE IN IRIDIUM HEXAHALOCOMPLEXES. PART 2: INFLUENCE OF THE PH ON THE REACTIONS OF THE HEXACHLOROIRIDITE AND HEXACHLOROIRIDATE IONS IN AQUEOUS SOLUTIONS.
W. J. Vanooij, and J. P. W. Houtman. 1973, 17p
IRI-133-73-02-PT-2
Subm-Submitted for Publication.

Descriptors: *Aqueous solutions, *Chlorine compounds, *Ions, *Iridium, *Ph, Electrophoresis, Ligands, Oxidation, Polymerization, Reaction kinetics, Reduction (Chemistry).

For abstract, see STAR 1121

N73-30676/3GA PC$4.50/MF$1.45
Rome Univ. (Italy). Inst. of Physics.
ON RAMAN SPECTROSCOPY OF TURBID SUSPENSIONS AND POWDERS SULLA SPETTROSCOPIA RAMAN DI SOSPENSIONI TORBIDE E POLVERI.
V. Mazzacurati. 23 Nov 71, 50p NOTA-INTERNA-346
Language in Italian.

Descriptors: *Gas lasers, *Powder (Particles), *Raman spectroscopy, *Signal to noise ratios, *Turbidity, Diffuse radiation, Experimental design, Interferometry, Line spectra, Suspending (Mixing), Transfer functions.

For abstract, see STAR 1121

N73-30678/9GA PC$6.75/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Freiburg (West Germany). Inst. fuer Angewandte Mathematik und Mechanik.
EXACT EQUATIONS FOR THE TRANSPORT COEFFICIENTS OF A FIVE-COMPONENT-MIXTURE AS A MODEL GAS OF DISSOCIATED AIR.
Ph.D. Thesis - Karlsruhe Univ., West Ger., 1971.
D. Straub. 5 May 72, 93p DLR-FB-72-34
In German; English Summary.

Descriptors: *Air, *Diffusion coefficient, *Gas dissociation, *Gas mixtures, *Gas transport, Boltzmann transport equation, Chapman-enskog theory, Gas viscosity, Gaseous diffusion, Ideal gas, Thermal conductivity, Thermal diffusion.

For abstract, see STAR 1121

N73-30689/6GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
COMPUTER PROGRAM FOR DETERMINING ROTATIONAL LINE INTENSITY FACTORS FOR DIATOMIC MOLECULES.
E. E. Whiting. Sep 73, 63p NASA-TN-D-7268, A-4863

Descriptors: *Diatomic molecules, *Line spectra, *Molecular structure, *User manuals (Computer programs), Electron states, Fortran, Spectroscopy.

For abstract, see STAR 1121

N73-30690/4GA PC$3.25/MF$1.45
Wisconsin Univ., Madison. Theoretical Chemistry Inst.
MOLECULAR COLLISIONS. 11: SEMICLASSICAL APPROXIMATION TO ATOM-SYMMETRIC TOP ROTATIONAL EXCITATION.
D. Russell, and C. F. Curtiss. 24 Aug 73, 22p NASA-CR-133849, WIS-TCI-499
Contracts NGL-50-002-001, NSF GP-28213A1

Descriptors: *Angular momentum, *Excitation, *Molecular collisions, Fluid flow, Molecular orbitals.

For abstract, see STAR 1121

N73-31034/4GA PC$5.75/MF$1.45
California Univ., Santa Cruz. Div. of Natural Sciences.
STABILITIES OF NITROGEN CONTAINING HETEROCYCLIC RADICALS AND GEOMETRICAL INFLUENCES ON NON-RADIATIVE PROCESSES IN ORGANIC MOLECULES.
Final Report, Sep. 1971 - Jun. 1972.
E. M. Evleth. Jun 72, 72p NASA-CR-133919
Contract NGL-05-061-004

Descriptors: *Indoles, *Nitrogen, *Potential energy, Absorption spectra, Atomic structure, Electron radiation, Heterocyclic compounds, Molecules.

For abstract, see STAR 1122

N73-31259/7GA PC$7.50/MF$1.45
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
A STUDY OF THE LARGE-SCALE RAREFIED FLOW FIELD THAT CAN BE OBTAINED THROUGH MOLECULAR EFFUSION FROM A PERFORATED BOUNDARY.
T. Ytrehus. Feb 73, 110p VKI-TN-79
Subm-Sponsored in Part by the Norweg. Council for Tech. And Sci. Res.

Descriptors: *Boltzmann transport equation, *Flow distribution, *Molecular flow, *Porous walls, Distribution functions, Equilibrium flow, Low density flow, One dimensional flow, Rarefied gas dynamics.

For abstract, see STAR 1122

N73-31497/3GA PC$3.75/MF$1.45
Cornell Univ., Ithaca, N.Y. Lab. of Atomic and Solid State Physics.
CONDUCTION IN FULLY IONIZED LIQUID METALS.
D. J. Stevenson, and N. W. Ashcroft. Aug 73, 33p NASA-CR-135648
Contracts NGR-33-010-188, NSF GH-36457

Descriptors: *Electrons, *Ionization, *Liquid metals, *Transport properties, Ions, Jupiter (Planet), Scattering.

For abstract, see STAR 1122

N73-31626/7GA PC$3.00/MF$1.45
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Electron Physics.
STREAMING DUE TO A THERMAL SURFACE TENSION GRADIENT.
D. Andersson. Apr 73, 15p TRITA-EPP-73-10

Descriptors: *Interfacial tension, *Liquid metals, *Streams, *Temperature gradients, Arc melting, Drops (Liquids), Lorentz force, Metal-gas systems, Plasma jets, Surface reactions.

For abstract, see STAR 1122

N73-31633/3GA PC$3.00/MF$1.45
Communications Research Centre, Ottawa (Ontario).
A SPECTROSCOPIC DETERMINATION OF THE 3 P 0 YIELDS 3 F 2 AND 3 P 0 YIELDS 3 H 6 TRANSITIONS OF THE PR(3 PLUS) ION IN SEOCL2:SNCL4.
A. Watanabe. Jul 73, 17p CRC-1243

Descriptors: *Electron transitions, *Spectroscopy, Chlorides, Emission spectra, Energy levels, Ions, Lasers.

For abstract, see STAR 1122

N73-31835/4GA PC$10.25/MF$1.45
Acurex Corp., Mountain View, Calif.
NONEQUILIBRIUM CHEMISTRY BOUNDARY LAYER INTEGRAL MATRIX PROCEDURE.
Final Report.
H. Tong, A. C. Buckingham, and H. L. Morse. Jul 73, 165p NASA-CR-134039, AEROTHERM-73-67
Contracts NAS9-9494, AEROTHERM PROJ. 6099

Descriptors: *Analytic functions, *Boundary layers, Coding, Integral equations, Matrices (Mathematics).

For abstract, see STAR 1122

ORO-2911-15/GA PC$4.50/MF$1.45
Virginia Univ., Charlottesville. Research Labs. For the Engineering Sciences.
INTERACTION OF HEAVY IONS WITH MATTER. PROGRESS REPORT AND SUMMARY REPORT.
J. W. Boring. Jun 73, 48p ESS-3930-110-73-U
Contract AT(40-1)-2911

Descriptors: (*Matter, *Atom collisions), (*Ion beams, *Collisions), Atomic beams, Biological radiation effects, Heavy ions, Ion collisions, Research programs.

For abstract, see NSA 28 07, number 17264.

PATENT-3 764 540/GA Not available NTIS
Department of the Interior, Washington, D.C.
MAGNETOFLUIDS AND THEIR MANUFACTURE.
Patent,
Sanaa E. Khalafalla, and George W. Reimers.
Filed 28 May 71, patented 9 Oct 73, 4p PAT-APPL-148 206, DOCKET/MIN-1567
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Colloids, Ferromagnetic materials), (*Patents, Colloids), Iron, Magnetite, Kerosene, Oleic acid, Dispersants, Preparation.
Identifiers: PAT-CL-252-62-55.

The patent relates to magnetofluids, comprising a stable, colloidal suspension of magnetite and elemental iron, they are produced by comminuting a nonmagnetic or antimagnetic precursor compound to colloidal size, dispersing the precursor in a carrier fluid and thereafter converting the precursor to ferromagnetic forms while in stable suspension.

PB-224 504/1GA PC$2.75/MF$1.45
Bureau of Mines, Washington, D.C.
DETERMINING EXPLOSIVE OIL IN DYNAMITES USING HIGH-PRESSURE LIQUID CHROMATOGRAPHY.
Rept. of Investigations, 1972-73,
T. Christos, and L. Spinetti. Sep 73, 10p BuMines-RI-7795
Prepared by Pittsburgh Mining and Safety Research Center, Pa.

Descriptors: (*Nitroglycerin, Chromatographic analysis), (*Dynamite, *Chromatographic analysis), Ethylene glycol.
Identifiers: *Ethylene gylcol/dinitrate, Liquid chromatography.

The explosive oils, nitroglycerine (NG) and ethylene glycol dinitrate (EGDN), were extracted from dynamites by a halocarbon solvent and were then determined by high-pressure liquid chromatography. Separation was achieved by liquid-liquid chromatography on a column packed with Durapak-Carbowax 400/Corasil II and the eluted NG and EGDN were detected with a double-beam UV detector. (Author)

PB-224 768/2GA PC$3.50/MF$1.45
Bureau of Mines, Washington, D.C.
CORRELATIONS OF PHASE-BOUNDARY PRESSURES OF CONDENSATE FLUID SYSTEMS WITH COMPOSITIONS MODIFIED BY ADDED BUTANE.
Rept. of Investigations,
Byron A. Baker, and C. Kenneth Eilerts. Oct 73, 64p BuMines-RI-7759
Prepared by Bureau of Mines, Bartlesville, Okla. Bartlesville Energy Research Center.

Descriptors: (*Phase diagrams, *Hydrocarbons), Natural gas, Butanes, Methane, Condensates, Liquid phase, Vapor phase, Regression analysis, Pressure, Gases.
Identifiers: Phase studies.

A windowed cell was used to measure the phase-boundary pressures of two related series of gas-condensate fluid mixtures. Heavy hydrocarbon parts of the mixtures were distillation fractions of a Gulf Coast condensate. Intermediates used with the distillation fractions were normal hydrocarbons in the butane-heptane range. The natural gas used contained approximately 90 percent methane and inert hydrocarbons. Normal butane was added to the mixtures incrementally to determine the effectiveness of such a change in composition for lowering phase-boundary pressure. The experimental range of temperatures was 50 to 280F. All the experimental data were correlated, so that the pressure required to maintain light oils mixed with natural gas in the single phase might be computed for secondary recovery applications. Two correlations developed contained independent variables to represent natural gas content, disparity of properties of components comprising the mixtures, and temperature. A fourth variable, for one correlation only, was the quantity of normal butane added to the original mixtures. This correlation with 15 coefficients is estimated to be accurate to 135 psi. (Author)

PB-224 813/6GA PC$5.25/MF$1.45
Maryland Univ., College Park. Dept. of Civil Engineering.
MECHANISM OF ORGANIC ADSORPTION ON ACTIVATED CARBON.
Completion rept., Jul 69-Aug 72,
Apr 73, 65p 17 W74-00565, OWRR-A-014-MD(1)
Contract DI-14-31-0001-3020

Descriptors: (*Activated carbon treatment, *Organic compounds), (*Organic sulfides, Activated carbon treatment), (*Adsorption, Activated carbon treatment), Organic polysulfides, Alkanes, Chemisorption, Aromatic aldehydes, Thiols, Sulfur organic compounds.
Identifiers: Chemical reaction mechanisms, Decane, Butane thiols, Disulfide/bis(butyl), Benzaldehyde/4-hydroxy.

Some knowledge is provided on the physicochemical nature of organic adsorption from aqueous solution on activated carbon. Carbon surface characteristics, as well as interactions with adsorbates, were studied. Filtrasorb 200, a commercial activated carbon produced from coal by high temperature steam activation, was used as the adsorbent with various adsorbates. Surface characteristics of the commercial activated carbon were modified by outgassing at different temperatures, and by dry and solution oxidation. Equilibrium and kinetic studies were conducted in batch systems, under controlled conditions of pH, ionic strength and temperature. The adsorption of mercaptan butyl disulfide, parahydroxybenzaldehyde, and decane were studied.

RLO-2230-T-2-10/GA PC$3.00/MF$1.45
Oregon Univ., Eugene.
DIFFUSION CONTROLLED REACTIONS AND EXCHANGE REACTIONS IN SOLUTION. ANNUAL PROGRESS REPORT.
R. M. Noyes. 29 May 73, 18p
Contract AT(45-1)-2230

Descriptors: (*Chemical reactions, *Research programs), Diffusion, Solutions.

For abstract, see NSA 28 07, number 17799.

SLA-73-5597/GA PC$4.25/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
APPLICATIONS OF PHOTON STATISTICS AND PHOTON CORRELATION.
D. W. Schaefer. 1973, 43p CONF-730712-1

Descriptors: (*Photons, *Scattering), (*Molecular biology, *Photon beams), Distribution, Molecules, Solutions, Spectra, Statistics.

For abstract, see NSA 28 07, number 17811.

SLA-73-637/GA PC$6.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
NEUTRON ACTIVATION ANALYSIS: TABULATION OF CROSS SECTIONS, Q-VALUES, DECAY CHARACTERISTICS, AND SENSITIVITIES.
B. T. Kenna, and P. E. Harrison. Jul 73, 89p

Descriptors: (*Activation analysis, *Sensitivity), (*Neutron reactions, *Cross sections), (*Nuclear reactions, Cross sections), Half-life, Neutron beams, Nuclear reaction yield, Q-value, Quantitative chemical analysis.

For abstract, see NSA 28 07, number 15178.

UCLA-34-P-88-34/GA PC$3.75/MF$1.45
California Univ., Los Angeles. Dept. Of Chemistry.
INTRA- AND INTER-MOLECULAR ENERGY TRANSFER STUDIES. PROGRESS REPORT, JUNE 1, 1972--MAY 31, 1973.
M. F. Nicol. 15 Jul 73, 32p
Contract AT(04-3)-34

Descriptors: (*Molecules, *Energy transfer), (*Benzene, *Lattice vibrations), (*Phosphors, *Physical radiation effects), Absorption spectra, Bibliographies, Compression, Luminescence, Raman effect, Research programs, Solids, Vibrational states.

For abstract, see NSA 28 08, number 17946.

UCRL-51374/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
KINETICS OF EXCIMER FORMATION IN RARE GASES.
J. A. Viecelli. 12 Mar 73, 12p
Contract W-7405-eng-48

Descriptors: (*Argon, *Electron collisions), (*Krypton, Electron collisions), Decay, Electron beams, Electrons, Emission spectra, Energy, Excitation, Fluorescence, Ionization potential, Ions, Photons, Recombination, Relativistic range, Xenon.

For abstract, see NSA 28 07, number 17821.

UCRL-51388/GA PC$5.45/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
ELEMENTAL ANALYSIS OF AIR FILTER SAMPLES USING X-RAY FLUORESCENCE.
N. A. Bonner, F. Bazan, and D. C. Camp. 1 Jun 73, 50p
Contract W-7405-eng-48

Descriptors: (*Air, *X-ray fluorescence analysis), (*Phosphorus, X-ray fluorescence analysis), (*Sulfur, X-ray fluorescence analysis), (*Chlorine, X-ray fluorescence analysis), Arsenic, Barium, Bromine, Cadmium, Calcium, Cerium, Cesium, Chemical analysis, Chromium, Copper, Europium, Excitation, Filters, Indium, Iron, Lead, Manganese, Mercury, Molybdenum, Multi-element analysis, Neodymium, Nickel, Nondestructive analysis, Pollution, Potassium, Quantitative chemical analysis, Radiation sources, Radioisotopes, Rubidium, Scandium, Strontium, Tellurium, Titanium, Vanadium, Zinc, Zirconium.

For abstract, see NSA 28 07, number 15234.

UCSD-34-P-196-30/GA PC$3.00/MF$1.45
California Univ., la Jolla, San Diego.
THEORETICAL STUDY OF ENERGY-TRANSFER PROCESSES. THREE YEAR PROGRESS REPORT, NOVEMBER 1, 1970--OCTOBER 31, 1973.
J. C. Y. Chen. 8 Jun 73, 12p
Contract AT(04-3)-34

Descriptors: (*Atom collisions, *Energy transfer), Scattering.

For abstract, see NSA 28 08, number 19451.

7E. Radio and Radiation Chemistry

AD-768 592/8GA Reprint
Chicago Univ Ill James Franck Inst
PRIMARY PHOTOCHEMICAL AND PHOTOPHYSICAL PROCESSES IN CHLORO- AND BROMO-ACETYLENE,
Keith Evans, Donald Heller, Stuart A. Rice, and Richard Scheps. 26 Sep 72, 28p AFOSR-TR-73-1825
Contract F44620-72-C-0003
Availability: Pub. in Jnl. of the Chemical Society, Faraday Transactions II, v69 p856-880 1973.

Descriptors: (*Halogenated hydrocarbons, *Photolysis), (*Alkynes, Fluorescence), Bromine compounds, Chlorine compounds, Photochemistry, Spectra(Infrared), Spectra(Visible + ultraviolet), Quenching(Inhibition), Molecular energy levels, Excitation, Ground state, Electron transitions, Relaxation time.
Identifiers: Quantum efficiency, Spectrum analysis, Acetylene/bromo, Acetylene/chloro.

Measurements of the fluorescence lifetimes and quantum yields of fluorescence from selected individual vibronic states of chloro-and bromo-acetylene are reported and the data analyzed in terms of the coupling of photon emission to the photodissociation reaction HCCX to HCC (doublet pi) + X (doublet P) where X = Cl, Br. An unusual variation with energy of the nonradiative lifetimes of vibronic states is found. The i.-r. and u.-v. spectra of chloro-and bromo-acetylene are re-investigated and differences between our findings and those of others are discussed in terms of the electronic structure of these molecules. (Modified author abstract)

AD-768 680/1GA Reprint
Pittsburgh Univ Pa Dept of Physics
EXCITATION OF THE CO FOURTH POSITIVE SYSTEM BY THE DISSOCIATIVE RECOMBINATION OF CO2(+) IONS,
R. A. Gutcheck, and E. C. Zipf. 11 Apr 73, 9p
Contract DA-31-124-ARO(D)-440, Grant NGL-39-011-030
Revision of report dated 29 Jan 73.
Availability: Pub. in Jnl. of Geophysical Research, v78 n25 p5429-5436, 1 Sep 73.

Descriptors: (*Carbon dioxide, Recombination reactions), (*Carbon monoxide, Excitation), (*Planetary atmospheres, Airglow), Dissociation, Ions, Afterglows, Fluorescence, Mars(Planet).
Identifiers: Emission spectra, *Mars atmosphere.

The fourth positve system of CO has been excited in a static afterglow experiment by the dissociative recombination of CO2(+) ions. From combined absolute optical and microwave measurements the specific recombination coefficient for exciting the CO system was found. This value represents approximately 5% of the total recombination will contribute significantly to the excitation of the CO fourth positive system in the martian airglow. Corroborative electron heating experiments showed that the magnitude of the specific recombination coefficient decreased as the electron temperature was increased. Evidence was also found for the presence of vibrationally excited ions in the CO2(+) plasma, a result which indicates that analogous laboratory studies on the dissociative recombination of O2(+), N2(+), and NO(+) ions may have also involved vibrationally hot plasmas. (Modified author abstracts)

AD-768 782/5GA PC$2.75/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
THE PHOTOLYSIS OF T-BUTYL NITRITE IN HYDROCARBON SOLUTION.
Memorandum rept.,
Lester P. Kuhn, and Alan C. Duckworth. Aug 73, 17p Rept no. BRL-MR-2316

Descriptors: (*Nitrites, *Photolysis), Organic solvents, Free radicals, Propellants, Decomposition, Nitrates, Gas chromatography, Nitroso compounds, Organic nitrogen compounds.
Identifiers: *Butyl nitrites, Chemical reaction mechanisms.

The photolysis of t-butyl nitrite in hydrocarbon solvents having abstractable hydrogen atoms results in the formation of t-butanol and solvent-derived nitroso dimer and/or oxime. The quantum yield is higher in cyclohexene than in cyclohexane or cyclopentane. There are many side reactions, two of which are photochemical decomposition of nitroso dimer and the Bamberger reaction. (Author)

AD-768 913/6GA PC$5.25/MF$1.45
Calspan Corp Buffalo N Y
EXPERIMENTAL STUDIES OF PHOTOIONIZATION PROCESSES IN AIR.
Final technical rept. 1 May 71-31 Aug 73,
Walter H. Wurster, Paul V. Marrone, and Thomas M. Albrechcinski. Oct 73, 61p Rept no. CALSPAN-AI-3107-A-4
Contract N00014-71-C-0387, ARPA Order-1479

Descriptors: (*Nitrogen oxides, Absorption spectrum), (*Air, *Photochemistry), (*Nitrogen,

Fluorescence), (*Shock waves, Fluorescence), Excitation, Electron transitions, Ultraviolet radiation, Spectra(Visible + ultraviolet), Shock tubes, Molecular energy levels, Gas ionization, Ions.
Identifiers: *Nitrogen oxide(NO), Quantum efficiency, Far ultraviolet radiation, Spectrum analysis, *Photoionization.

The experimental program described herein was designed to investigate vacuum ultraviolet radiation processes in air, with particular emphasis directed at the interaction of shock-induced nonequilibrium radiation with gaseous species. The program was divided into three main tasks which were: (1) To perform (NO) absorption measurements using a shock-tube splitter plate technique. (2) To investigate VUV excitation mechanisms using sidewall radiation overshoot measurements. (3) To perform endwall radiation measurements of the advancing shock front to verify previously developed excitation and radiative flux models. The results of this program are summarized. (Modified author abstract)

AD-769 024/1GA Reprint
Joint Inst for Lab Astrophysics Boulder Colo
PHOTODETACHMENT OF NEGATIVE IONS,
W. C. Lineberger. 1973, 24p
Contract DAHC04-72-C-0047
Availability: Pub. in Energy, Structure and Reactivity, p333-355 1973.

Descriptors: (*Ions, *Photochemistry), Lasers, Photolysis, Laboratory equipment, Free radicals, Selenium, Gold, Silver, Copper, Hydroxides.
Identifiers: *Photodetachment, Anions, Tunable lasers, Laser beams.

The vastly increased wavelength resolution at kilowatt pulse powers obtainable with continuously tunable dye lasers compared to conventional light sources affords a unique opportunity to make precise threshold measurements in photodetachment of negative ions. This paper describes briefly a tunable laser photodetachment apparatus, the current status of threshold photodetachment theory and recent tunable laser photodetachment data for atomic and molecular ions. The difficulties involved in interpreting the molecular ion photodetachment data lead to considering the possibility of multiphoton photodetachment and photodissociation as an alternative means of obtaining negative ion structure information. Comparisons with theoretical results are made where appropriate. Some conservative predictions are made concerning experiments that are possible with straightforward extensions of today's technology.

AE-471/GA PC$3.50/MF$1.45
Aktiebolaget Atomenergi, Studsvik (Sweden).
NUCLEAR CHEMISTRY PROGRESS REPORT, 1972.
G. Carleson. May 73, 27p
U.S. Sales Only.

Descriptors: (*Technetium 99, *Isotope production), (*Radiation chemistry, *Research programs), Alkali metal compounds, Evaporation, Isomeric nuclei, Melting points, Molybdenum oxides, Molybdenum 99, Radioisotope generators, Separation processes, Technetium oxides.

For abstract, see NSA 28 07, number 15406.

CALT-767-P-4-123/GA PC$4.50/MF$1.45
California Inst. Of Tech., Pasadena.
STUDIES IN CHEMICAL DYNAMICS AND RADIATION CHEMISTRY. TECHNICAL PROGRESS REPORT, JULY 1, 1972--JUNE 30, 1973.
A. Kuppermann. 30 Jun 73, 46p
Contract AT(04-3)-767

Descriptors: (*Chemical reaction kinetics, *Research programs), (*Radiation chemistry, Research programs), Chemical reactions, Molecular beams, Molecules, Photolysis.

For abstract, see NSA 28 07, number 15300.

CEA-R-4406/GA PC$6.00/MF$1.45
Commissariat a l'Energie Atomique, Bruyeres-le-Chatel (France). Centre d'Etudes.
ELECTROCHEMICAL BEHAVIOR OF THE STATES OF OXIDATION OF PU IN A SODIUM HYDROXIDE MEDIUM.
J. Bourges. Jun 73, 79p
In French. U.S. Sales Only.

Descriptors: (*Plutonium, *Oxidation), Electrochemistry, Sodium hydroxides.

For abstract, see NSA 28 07, number 15372.

CNEA-342/GA PC$3.00/MF$1.45
Comision Nacional de Energia Atomica, Buenos Aires (Argentina).
PREPARATION OF THYMOL EXP 131 I.
M. Sanchez Vera, G. N. Bianco de Salas, and A. E. A. Mitta. 1973, 7p
In Spanish. U.S. Sales Only.

Descriptors: (*Thymol, *Labelling), (*Iodine 131, *Isotopic exchange), Amines, Chemical preparation, Labelled compounds, Organic chlorine compounds, Stability.

For abstract, see NSA 28 08, number 17969.

CNEA-343/GA PC$3.00/MF$1.45
Comision Nacional de Energia Atomica, Buenos Aires (Argentina).
PREPARATION OF BENZOIMIDAZOLE EXP 131 I.
R. J. Correia, G. N. Bianco de Salas, and A. E. A. Mitta. 1973, 8p
In Spanish. U.S. Sales Only.

Descriptors: (*Imidazoles, *Labelling), (*Iodine 131, *Isotopic exchange), Amines, Labelled compounds, Organic chlorine compounds, Ph value, Stability, Temperature dependence.

For abstract, see NSA 28 08, number 17970.

COM-73-50878/0GA Not available NTIS
Nationalureau of Standards, Washington, D.C.
THE LIMIT OF PRECISION IN NUCLEAR AND ANALYTICAL CHEMISTRY.
Final rept.,
L. A. Currie. 1972, 9p
Pub. in Nuclear Instruments and Methods, v100 p387-395 1972.

Descriptors: (*Radioactivation analysis, Precision), (*Radiochemistry, *Precision), (*Counting, Precision), Random error, Neutron activation analysis, Poisson density functions, Photonuclear reactions, Computer programs, Statistical analysis, Standard error, Experimental design.

The precision associated with an experiment in nuclear chemistry or activation analysis is commonly estimated by means of Poisson counting statistics. Such an estimate, as well as the conclusion that the precision may be indefinitely improved by increasing the number of counts obtained is necessarily wrong when additional sources of random error are operating. Knowledge of the additional, non-Poisson component of random error is required for reliable estimates of parameters and their standard errors, to detect model errors, to plan counting experiments efficiently, and to establish the limit of precision when the Poisson counting error becomes negligible. For these purposes, an iterative computation program--XESS--has been developed to take into account the additional variances and unequal statistical weights. The significance and detectability of excess variance is illustrated with data from studies of photonuclear reactions and activation analysis.

COO-3286-5/GA PC$3.00/MF$1.45
Johns Hopkins Univ., Baltimore, MD. Dept. Of Biochemistry.
CHEMICAL STUDY OF THE EFFECTS OF RADIATION ON NUCLEIC ACIDS AND RELATED COMPOUNDS. ANNUAL PROGRESS REPORT, AUGUST 1972--JULY 1973.
S. Y. Wang. Jul 73, 6p
Contract AT(11-1)-3286

Descriptors: (*Nucleic acids, *Chemical radiation effects), (*Thymine, *Chromosomal aberrations), Peroxides, Research programs.

For abstract, see NSA 28 07, number 15301.

COO-3416-10/GA PC$5.75/MF$1.45
Pennsylvania State Univ., University Park.
RADIATION CHEMISTRY AND MASS SPECTROMETRY OF SILANES AND GERMANES. PROGRESS REPORT, JUNE 1, 1972--MAY 31, 1973.
F. W. Lampe. 1973, 71p
Contract AT(11-1)-3416

Descriptors: (*Silanes, *Radiation chemistry), (*Nitrogen oxides, *Radiolysis), (*Methane, Radiolysis), Chemical reactions, Ions, Mass spectroscopy, Molecules, Research programs.

For abstract, see NSA 28 07, number 15302.

DP-MS-71-88/GA PC$3.50/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S. C. Savannah River Lab.
DESORPTION OF RADIOIODINE FROM ACTIVATED CARBON IN AN INTENSE GAMMA RADIATION FIELD.
A. G. Evans. 16 May 72, 26p CONF-720614-10
Contract AT(07-2)-1

Descriptors: (*Iodine isotopes, *Desorption), (*Savannah reactor, *Filters), (*Activated carbon, *Sorptive properties), Chemical radiation effects, Containment systems, Gamma radiation, Gaseous wastes, Organic iodine compounds, Radioactive wastes, Reactor accidents, Temperature dependence.

For abstract, see NSA 28 08, number 18061.

DP-MS-72-68/GA PC$3.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S. C. Savannah River Lab.
CURIUM-244 ALPHA RADIOLYSIS OF NITRIC ACID. OXYGEN PRODUCTION FROM DIRECT RADIOLYSIS OF NITRATE IONS.
N. E. Bibler. 1973, 17p CONF-730403-4
Contract AT(07-2)-1

Descriptors: (*Nitric acid, *Radiolysis), (*Sodium nitrates, Radiolysis), (*Oxygen, *G value), (*Hydrogen, G value), Alpha particles, Curium 244, Plutonium, Sulfuric acid.

For abstract, see NSA 28 08, number 17991.

LIB/Trans-503/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr).
STUDY OF TRANSPLUTONIUM ELEMENT HYDROLYSIS. II. HYDROLYSIS OF AMERICIUM(III) IN THE PRESENCE OF IONS WITH POSITIVE AND NEGATIVE HYDRATION ENERGY.
Yu. S. Korotkin. Jun 73, 8p
Translation of JINR--P6-6403. U.S. Sales Only.

Descriptors: (*Americium, *Hydrolysis), Americium complexes, Americium compounds, Cations, Chemical reaction kinetics, Chromatography, Electrolytes, Lithium compounds, Nitrates, Nitric acid, Perchloric acid, Ph value, Potassium compounds, Sodium compounds.

For abstract, see NSA 28 08, number 18028.

LIB/Trans-504/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr).
STUDY OF TRANSURANIUM ELEMENT HYDROLYSIS. III. AMERICIUM AND CURIUM HYDROLYSIS IN SOLUTIONS OF PURE NITRIC ACID.
Yu. S. Korotkin. Jun 73, 5p
Translation of JINR--P6-6404. U.S. Sales Only.

Descriptors: (*Americium, *Hydrolysis), (*Curium, Hydrolysis), Americium complexes, Americium compounds, Ammonium compounds, Cations, Chemical reaction kinetics, Chromatography, Curium compounds, Electrolytes, Lithium compounds, Nitrates, Nitric acid, Ph value.

For abstract, see NSA 28 08, number 18029.

NP-19805/GA PC$3.00/MF$1.45
Jyvaskyla Univ. (Finland). Dept. Of Physics.
HELIUM-JET TRANSPORTATION OF RECOIL ATOMS INTO A LIQUID PHASE.
P. Puumalainen, J. Aysto, and K. Valli. Mar 73, 12p
U.S. Sales Only.

Descriptors: (*Recoils, *Separation processes), Atoms, Hot atom chemistry, Liquids, Radiochemistry.

For abstract, see NSA 28 07, number 15364.

NRCN-291/GA PC$4.00/MF$1.45
Israel Atomic Energy Commission, Beersheba. Nuclear Research Center-Negev.
PULSE RADIOLYSIS OF METALLIC IONS IN AQUEOUS SOLUTIONS. PART I. PULSE RADIOLYSIS OF HG EXP 2+ AND HG SUB 22+ .
M. Faraggi, and A. Amozig. Feb 71, 13p
U.S. Sales Only.

Descriptors: (*Mercury compounds, *Radiolysis), Aqueous solutions, Cations, Inorganic acids, Pulsed irradiation, Radiation chemistry.

For abstract, see NSA 28 07, number 15304.

ORO-2825-32/GA PC$3.00/MF$1.45
Vanderbilt Univ., Nashville, Tenn.
STUDIES IN RADIATION AND CATALYTIC CHEMISTRY BY MASS SPECTROMETRY, FLASH PHOTOLYSIS, AND MAGNETIC TECHNIQUES. FINAL REPORT, JANUARY 1, 1971--DECEMBER 31, 1972.
T. W. Martin. 10 Jan 73, 6p
Contract AT(40-1)-2825

Descriptors: (*Ammonia, *Oxidation), (*Amines, Oxidation), (*Cyanides, Oxidation), (*Hydronium radicals, *Electron spin resonance), Radiation chemistry, Research programs, Aqueous solutions, Benzene, Chemical reactions, Decay, Lasers, Magnetic fields, Nitrates, Nitric acid, Photolysis, Pulses, Radicals, Stilbene, Catalysts, Mass spectroscopy, Palladium, Pressure dependence, Temperature dependence, Cerium compounds, Paramagnetism.

For abstract, see NSA 28 07, number 15305.

ORO-3106-48/GA PC$3.00/MF$1.45
Florida Univ., Gainesville.
RADIATION CHEMISTRY OF HYDROCARBON AND ALKYL HALIDE SYSTEMS. PROGRESS REPORT, AUGUST 1, 1972--JULY 31, 1973.
R. J. Hanrahan. 1973, 19p
Contract AT(40-1)-3106

Descriptors: (*Radiation chemistry, *Research programs), (*Hydrocarbons, Radiation chemistry), (*Halogenated aliphatic hydrocarbons, Radiation chemistry), (*Fluorinated aliphatic hydrocarbons, *Radiolysis), Brominated aliphatic hydrocarbons, Ethylene, Fluorinated alicyclic hydrocarbons, Gases, Hot atom chemistry, Iodinated aliphatic hydrocarbons, Mass spectroscopy, Organic bromine compounds, Organic fluorine compounds, Organic halogen compounds, Organic iodine compounds.

For abstract, see NSA 28 08, number 17994.

RRL-3238-436/GA PC$3.25/MF$1.45
Mellon Inst. Of Science, Pittsburgh, PA. Radiation Research Labs.
QUARTERLY REPORT, JANUARY 1, 1973--MARCH 31, 1973.
3 Apr 73, 23p
Contract AT(11-1)-3238

Descriptors: (*Radiation chemistry, *Research programs).

For abstract, see NSA 28 07, number 15306.

UCRL-Trans-10699/GA PC$3.75/MF$1.45
KINETICS OF TWO-STEP SELECTIVE PHOTODISSOCIATION OF MOLECULES BY LASER RADIATION.
V. S. Letokhov, and A. A. Makarov. 1972, 34p
Translation of Russian Preprint No. 2.

Descriptors: (*Molecules, *Dissociation), Infrared radiation, Laser radiation, Ultraviolet radiation.

For abstract, see NSA 28 07, number 17824.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

AD-768 399/8GA PC$4.75/MF$1.45
Arctic Inst of North America Washington D C
STUDIES ON ORGANISMS FOUND IN ARCTIC SEA ICE.
Technical rept. 1970-72,
Rita A. Horner. Mar 73, 157p Rept no. AINA-ONR-431:20
Contract N0014-70-A-0219-0001
Prepared in cooperation with the Alaska Univ., College. Inst. of Marine Science.

Descriptors: (*Microorganisms, *Sea ice), (*Marine biology, *Arctic Ocean), Plankton, Sea water, Temperature, Salinity, Chlorophylls, Sampling, Deep water, Organic compounds.
Identifiers: Primary biological productivity.

Preliminary studies of the organisms living in sea ice and the ice habitat at Barrow, Alaska, are presented; this community is compared with the phytoplankton community that occurs in the seawater under the ice and during the open water period. Parameters examined include salinity, temperature, nutrient and chlorophyll a concentrations, and primary productivity. The uptake of dissolved organic compounds was studied to determine the heterotrophic potential of the ice community. Other areas sampled included Eluitkak Pass, Wainwright, Prudhoe Bay, and deep water sites 25 to 150 miles offshore. A kelp bed near the Naval Arctic Research Laboratory is described. (Author)

AD-768 488/6GA Not available NTIS
Institute for Marine Environmental Research Endinburgh (Scotland) Oceanographic Lab
MARINE BIOLOGY AND THE OCEAN WEATHER SHIPS,
D. H. Jones. 1973, 12p
Availability: Pub. in the Marine Observer, v43 p73-77 1973.

Descriptors: (*Marine biology, *Atlantic Ocean), (*North Sea, Marine biology), Plankton, Samplers, Fishes, Oceanographic vessels, Great Britain.

The primary objective of the laboratory during the whole of this period has been to study changes in the abundance, distribution and composition of plankton in samples collected each month along standard shipping routes in the North Sea and the North Atlantic. The apparatus used to collect these samples is called the Hardy Continuous Plankton Recorder.

AD-768 688/4GA Not available NTIS
Institute for Marine Environmental Research Endinburgh (Scotland) Oceanographic Lab
CONTINUOUS PLANKTON RECORDS: A PLANKTON ATLAS OF THE NORTH ATLANTIC AND THE NORTH SEA.
Feb 73, 193p
Availability: Pub. in Bulletins of Marine Ecology, v7 p1-174 Feb 73. Paper copy available from Oceanographic Laboratory, Institute for Marine Environmental Research, 78 Graighall Road, Edinburgh EH6 4RQ, Scotland. PC: L2.75.

Descriptors: (*Marine biology, Reports), Bibliographies, Plankton, Invertebrates, Algae, Mollusca, Arthropods, Sampling, Maps, Indexes, Distribution, North Sea, Atlantic Ocean, Great Britain.

Contents:
Sir Alister Hardy;
Bibliography of the continuous plankton recorder 1926-1971;
Continuous plankton records:
A plankton atlas of the North Atlantic and the North Sea.

AD-769 096/9GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
BOTTOM WATER AND BENTHONIC FORAMINIFERA IN THE NORTH ATLANTIC-GLACIAL-INTERGLACIAL CONTRASTS,
S. Stephen Streeter. 18 Jan 73, 14p Rept no. LDGO-1960
Contract N00014-67-A-0108-004
Availability: Pub. in Jnl. of Quaternary Research, v3 n1 p131-141 Jun 73.

Descriptors: (*Foraminifera, *Atlantic Ocean), (*Ocean bottom, *Marine biology), Periodic variations.
Identifiers: Benthos, Paleoclimatology, Bathymetry, North Atlantic Ocean.

The paper presents some preliminary results of a survey of the modern and late Pleistocene distribution of benthonic foraminifera in the bottom sediments of the deep North Atlantic.

COM-73-11769/9GA Reprint
National Marine Fisheries Service, Seattle, Wash. Northwest Fisheries Center.
PELAGIC RECORDS OF GLAUCOUS-WINGED AND HERRING GULLS IN THE NORTH PACIFIC OCEAN,
Gerald A. Sanger. 25 May 73, 12p NOAA-73092722

Descriptors: (*Birds, *Pacific Ocean), Pelagic zone, Identifying, Ocean environments.
Identifiers: Larus glaucescens, Larus argentatus.

Glaucous-winged Gulls (Larus glaucescens) and Herring Gulls (L. argentatus) have been sighted sometimes hundreds of miles offshore in the eastern North Pacific Ocean. Yocom (1947) saw both species out to 500 miles off California and Sanger (1965, 1970) noted them to nearly 600 miles off Washington and Oregon, but no pelagic specimens of either species existed (A.O.U., 1957). This paper documents the first pelagic specimen records of these species off the Pacific Coast of North America; it discusses concurrent pelagic sightings and summarizes the literature on prior pelagic sightings. Both species are much more pelagic than was previously suspected. (Author)

COM-73-11770/7GA PC$3.75/MF$1.45
Boston Univ., Mass.
POSEIDON/72,
Kenneth R. H. Read. 1972, 89p NOAA-73101101
Grant NSF-GH-74
Pub. in Proceedings of Student Symposium on Project Poseidon, Boston Univ., 25 May 72, in conjunction with Conference on Marine Careers and International Underwater Clinic of the Boston Sea Rovers (18th) May 72.

Descriptors: (*Marine biology, Research), Meetings, Ecology, Marine fishes, Invertebrates, Seasonal variations, Benthos, Diving, Algae, Porifera, Crabs, Crustacea.
Identifiers: Sea Grant program, Ascophyllum nodosum, Rhodymenia palmata, Echinometra lucunter, Cancer magister, Derocheilocaris typicus, Aequipecten irradians.

The report is a compilation of 12 papers which constitute the proceedings of the student symposium project Poseidon. The major focus is on biological aspects of the marine sciences. Titles of the papers are: Zoosporogenesis in the genus Chorda; Ecological variation in Ascophyllum nodosum; Preliminary studies on the growth and ontogeny of Rhodymenia palmata; Intertidal zonation at the Isles of Shoals; The mechanisms and the factors affecting the boring activity of the sea urchin, Echinometra lucunter; A new class of the Porifera Sclerospongiae; A feasibility study concerning the introduction of the edible crab, Cancer magister, into New England waters; temporal distribution and relative abundance of fish in Nannaquaket Pond, R I; maintenance of the interstitial marine crustacean, Derocheilocaris typicus, in the laboratory; seasonal variation in the chemical composition of the bay scallop, Aequipecten irradians; simple qualitative and quantitative sampling of benthic marine sublittoral; and Saturation diving, a marine biological research tool.

COM-73-11784/8GA PC$3.00/MF$1.45
Delaware Univ., Newark. Coll. of Marine Studies.
UNIVERSITY OF DELAWARE, SEA GRANT ANNUAL REPORT 1971-72.
Annual rept. 1 Sep 71-31 Dec 72.
1973, 26p NOAA-73100502

Descriptors: (*Oceanography, Research projects), Seafood, Natural resources, Aquaculture, Coasts, Sediments, Marine biology, Shellfish, Environmental surveys, Delaware.
Identifiers: *Sea Grant program.

The report summarizes the Sea Grant program activity of the University of Delaware for the period September 1, 1971 to December 31, 1972, including the first year of institutional status and the University's fourth year of participation in the program. Five functional groups participated in these activities: Food from the Sea; System Engineering for Development Options; Socio-Economic Aspects of Coastal Zone and Marine Resource Development; Environmental Impact; and Coast Zone Management.

COM-73-11832/5GA PC$3.75/MF$1.45
Louisiana State Univ., Baton Rouge. Center for Wetlands Resources.
COMMUNITY STRUCTURE AND CARBON BUDGET OR A SALT MARSH AND SHALLOW BAY ESTUARINE SYSTEM IN LOUISIANA,
John W. Day, Jr., William G. Smith, Paul R. Wagner, and Wilmer C. Stowe. May 73, 84p*
LSU-SG-72-04 NOAA-73100301
Contract NOAA-2-35231

Descriptors: (*Barataria bay, *Ecology), Primary biological productivity, Swamps, Estuaries, Bays, Aquatic plants, Benthos, Carbon, Feeding habits, Louisiana, Food chains, Aquatic biology, Plankton, Crabs, Shrimps, Oysters, Fishes, Birds, Aquatic microbiology, Aquatic animals, Biochemical cycles.
Identifiers: Sea Grant program, Ecousystems, Salt marshes, Spartina alterniflora, Cordgrass.

Barataria Bay, one of the estuaries of the coastal zone of Louisiana is described. The salt marsh, water column and benthic communities are each divided into several subunits. Each of these components is treated in terms of seasonal and spatial variations of abundance, feeding habits, life histories, trophic position and commercial importance. A carbon budget is presented for each of the components and for the whole marsh-estuarine community. A budget of the entire estuary was constructed. (Modified author abstract)

COM-73-11844/0GA PC$5.75/MF$1.45
Moss Landing Marine Labs., Calif.
A QUANTITATIVE SURVEY OF THE BENTHIC INFAUNA OF NORTHERN MONTEREY BAY, CALIFORNIA.
Annual rept. Aug 71-Feb 73 on Part 8,
Alfred T. Hodgson, and James W. Nybakken.
1973, 248p CASUC-MLML-TP-73-08, Contrib-40 NOAA-73092807
Grant NOAA-SGP2-94
See also Part 7, COM-73-11646.

Descriptors: (*Benthos, Tables(Data)), (*Aquatic biology, *Monterey Bay), Invertebrates, Aquatic animals, Sediments, Gastropoda, Crustacea, Identifying, Sampling, Classifications.
Identifiers: Sea Grant program, Polychaeta, Bivalvia, Ophiuroidea.

The two principal objectives of this study were to obtain quantitative information on the composition of the shallow water benthic infauna communities of northern Monterey Bay and subsequently to evaluate their natural variation in time and space. This final data report discusses the methods employed in the survey and presents the initial reduction of the data on the benthic infauna for the period of August 1971 through February 1973. Some 383 species of infaunal organisms were collected and 137,465 individuals have been identified.

COM-73-50888/9GA PC-GPO/MF$1.45-NTIS
National Marine Fisheries Service, Seattle, Wash.
MARINE FLORA AND FAUNA OF THE NORTHEASTERN UNITED STATES. PROTOZOA: CILIOPHORA.
Technical rept.,
Arthur C. Borror. Sep 73, 67p NOAA-TR-NMFS-Circ-378 NOAA-73100902
Paper copy available from GPO $0.65 as C55.13:NMFS:Circ-378.

Descriptors: (*Protozoa, Taxonomy), (*Marine biology, United States), Coasts, Estuaries, Ciliata, Bibliographies, Indexes(Documentation), Aquatic plants, Aquatic animals, Manuals.
Identifiers: Ciliophora, New England, Taxonomic keys.

The manual includes an introduction on the general biology, an illustrated key, an annotated systematic list, a selected bibliography, and an index to the marine ciliated Protozoa of coastal and estuarine waters of New England. The key facilitates identification to family of nonencysted, nondividing marine ciliates at any stage in the life cycle. (Author)

8B. Cartography

AD-768 798/1GA PC$2.75/MF$1.45
Washington Univ Seattle Dept of Geography
A PSYCHOPHYSICAL INVESTIGATION OF CARTOGRAPHIC TECHNIQUE.
Final rept. 1 Jun 71-30 Jun 73,
Phillip C. Muehrcke. Aug 73, 11p AROD-9671:1-EN
Grants DA-ARO-D-31-124-71-G147, DA-ARO-D-31-124-73-G86

Descriptors: (*Maps, Design), (*Map reading, Visual perception), Pattern recognition, Performance(Human), Correlation techniques.
Identifiers: Computer aided mapping, Comparison.

The goal of the research was to ascertain the extent to which the visual map comparison performance of human subjects is influenced by map user experience, the type of computer-generated cartographic depiction the complexity of map patterns, and the degree of simple statistical correlation between pairs of maps. The dependent variable was defined as the number of errors in ranking maps on a cross-correlation continuum with a referent stimulus. (Author)

E73-11089/GA PC$3.00/MF$1.45
Tennessee Univ., Knoxville. Dept. of Electrical Engineering.
ERTS-1 IMAGERY INTERPRETATION TECHNIQUES IN THE TENNESSEE VALLEY.
Progress rept. 25 Mar-25 Sep 73,
Robert E. Bodenheimer. Oct 73, 10p NASA-CR-135557
Contract NAS5-21875

Descriptors: Land use, Crop identification, Terrain analysis, Tennessee Valley(AL-KY-TN), Data processing, Earth resources program, Forests, Water, Farmlands.

The author has identified the following significant results. Significant findings are presented which demostrate the feasibility of delineating major terrain features, land uses, and crop species through computerized analyses. Delineation of features are presently restricted to unsurveyed areas within the same scene as the test sites. Channel six appears to give or contain the most information for making feature separations of cropland, pasture, forest, and water.

E73-11127/GA PC$3.75/MF$1.45
Wyoming Univ., Laramie. Remote Sensing Lab.
RECONNAISSANCE GEOLOGIC MAPPING IN THE DRY VALLEYS OF ANTARCTICA USING THE EARTH RESOURCES TECHNOLOGY SATELLITE.
Special rept.,
Robert S. Houston, Frank W. Zochol, and Scott B. Smithson. 5 Aug 73, 33p ERTS-ANT-S-73A
NASA-CR-135665
Contract NAS5-21818
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S. D. 57198. ERTS.

Descriptors: Photogeology, Photomapping, Antarctic regions, Valleys, Earth resources program, Photointerpretation, Structural properties(Geology).

The author has identified the following significant results. Reconnaissance geologic mapping can be done with 60-70% accuracy in the Dry Valleys of Antarctica using ERTS-1 imagery. Bedrock geology can be mapped much better than unconsolidated deposits of Quaternary age. Mapping of bedrock geology is facilitated by lack of vegetation, whereas mapping of Quaternary deposits is hindered by lack of vegetation. Antarctic images show remarkable clarity and under certain conditions (moderate relief, selection of the optimum band for specific rock types, stereo-viewing) irregular contacts can be mapped in local areas that are amazingly like those mapped at a scale of 1:25,000, but, of course, lack details due to resolution limitations. ERTS-1 images should be a valuable aid to Antarctic geologists who have some limited ground truth and wish to extend boundaries of geologic mapping from known areas.

E74-11121/GA PC$3.00/MF$1.45
Nebraska Univ., Lincoln.
PROPOSAL TO EVALUATE THE USE OF ERTS-A IMAGERY IN MAPPING AND MANAGING SOIL RANGE RESOURCES IN THE SAND HILLS REGION OF NEBRASKA.
Progress rept. 1 Jul-30 Aug 73,
James V. Drew. 12 Oct 73, 9p NASA-CR-135659
Contract NAS5-21756

Descriptors: Soil mapping, Range resources, Resources management, Sand Hills Region(NE), Earth resources program, Soil science, Multispectral band scanners, Vegetation.

The author has identified the following significant results. Delineation of soil associations of McPherson County was accomplished with MSS band five image 1025-16554 and MSS band 6 image 1170-17020. Image 1025-16554 provided delineation of associations where subirrigated meadows and cultivated fields were the predominant features. Image 1170-17020 which is winter imagery with snow cover and low sun angle delineated those associations which were significantly different in topography.

PB-224 606/4GA PC$3.00/MF$1.45
National Center for Atmospheric Research, Boulder, Colo.
'ELLIPSCRIBE'.
Final rept.,
Clark Parsons. 1 Oct 63, 5p NSF-73-32-C-760
Contract NSF-C760

Descriptors: (*Drafting(Drawing), Instruments), Ellipsoids, Mapping, Earth surface.

Ellipscribe drawings are orthographic projections of hemispherical surfaces, namely earth hemispheres, to help clarify mathematical equations of spherical trigonometry. The report describes an instrument for drawing ellipsoids. (Modified author abstract)

8C. Dynamic Oceanography

AD-768 645/4GA Reprint
Florida State Univ Tallahassee Geophysical Fluid Dynamics Inst
A MULTI-LAYER TRANSIENT MODEL OF COASTAL UPWELLING,
Richard R. McNider, and James J. O'Brien. 5 Apr 73, 19p Rept nos. GFDI-Contrib-83, 115
Contract N00014-67-A-0235-0002
Revision of report dated 19 Jun 72.
Availability: Pub. in Jnl. of Physical Oceanography, v3 n3 p258-273 Jul 73.

Descriptors: (*Ocean currents, Mathematical models), Continental shelves, Seacoast, Transients.
Identifiers: *Upwelling, Stratification, Gravity waves, Coasts, Air water interactions.

A four-layer numerical model of a stratified ocean on a beta-plane has been used to investigate the vertical structure of the wind-driven upwelling circulation in its evolving stages. Over a flat shelf the return flow supplying the upwelling motions is found to be evenly distributed throughout the lower three layers. The width of the upwelling zone spreads laterally with increasing depth and the strength of the vertical motion is reduced. In the longshore flow an equatorward surface jet and a poleward undercurrent are the dominant features. The equatorward jet axis tilts offshore with depth. The depth at which the poleward undercurrent forms depends upon the stratification and wind stress imposed.

AD-768 646/2GA Reprint
Florida State Univ Tallahassee Geophysical Fluid Dynamics Inst
A NUMERICAL STUDY OF THE STEADY CIRCULATION IN AN OPEN BAY,
Ya Hsueh, and Chich-Yuan Peng. 30 Nov 72, 10p Rept nos. GFDI-Contrib-78, 114
Contract N00014-67-A-0235-0002
Revision of report dated 21 Sep 72.
Availability: Pub. in Jnl. of Physical Oceanography, v3 n2 p220-225 Apr 73.

Descriptors: (*Ocean currents, Bays), Interactions, Ocean bottom topography, Mathematical models, Hydrodynamics, Wind, Seacoast, Continental shelves, Mexico Gulf, Florida.
Identifiers: Circulation, Air water interactions.

The steady-state circulation in a rectangular bay is studied numerically in a model of homogeneous water and vertical coasts. The competing influences of the surface winds and longshore currents flowing by the open side of the bay and the effect of the bathymetry are emphasized. For a wind-stress field that does not vary along the coast but decays linearly inshore from the open side of the bay, the mass-transport streamfunction contours form a gyre rotating in the sense of the wind-stress curl. A uniform continental shelf slope distorts the gyre by creating depth variations that cause vortex stretching. Consequently, the streamlines become more packed to the right of the down-slope direction. The nonlinearity bends to destroy symmetry by crowding streamlines in the direction of the induced current. The influence of large-scale ocean currents along the open side is normally confined to the outer half of the bay. When the wind is blowing against these currents, the influence of the wind creates two gyres, one each at the inshore corners of the bay. (Author)

AD-768 647/0GA Reprint
Florida State Univ Tallahassee Dept of Oceanography
NUTRIENTS AND WATER MASSES AT THE MOUTH OF THE GULF OF CALIFORNIA,
C. E. Warsh, K. L. Warsh, and R. C. Staley. 14 Dec 72, 13p Rept no. 113
Contract N00014-67-A-0235-0002, Grant NSF-GB-6871
Sponsored in part by Grant NSF-GA-19542. Revision of report dated 17 Oct 72.
Availability: Pub. in Deep-Sea Research, v20 p561-570 1973.

Descriptors: (*Ocean currents, *Pacific Ocean), Phosphates, Silicates, Salinity, Temperature, Mexico.
Identifiers: *California Gulf, Sea Grant Program.

Two sections of eleven hydrographic stations were worked across the mouth of the Gulf of California in July, 1967. The water masses near the mouth of the Gulf were identified and traced into the Gulf by physical-chemical relations. Silicate-salinity and phosphate-salinity diagrams were especially useful for such determinations. Water masses distinguished were: (1) Gulf Surface Water--a mixture of surface waters of the California Current and Tropical Surface Water modified by intensive heating, (2) Transition Water A--a mixture of subsurface waters of the California Current and Tropical Surface Waters, (3) Transition Water B--a mixture of California Current Subsurface Waters and Subtropical Subsurface Waters, (4) Pacific Equatorial Water--below 200 m, and (5) Gulf Water--high salinity water. (Modified author abstract)

AD-768 683/5GA Reprint
Scripps Institution of Oceanography La Jolla Calif
INTERNAL WAVE BREAKING AND MICROSTRUCTURE (THE CHICKEN AND THE EGG),
Walter H. Munk, and Christopher J. R. Garrett. 8 Aug 72, 10p
Contract N00014-69-A-0200-6008
Prepared in cooperation with Dalhousie Univ., Halifax (Nov Scotia).
Availability: Pub. in Boundary-Layer Meteorology, v4 p37-45 1973.

Descriptors: (*Ocean waves, *Hydrodynamics), Transport properties, Density, Numerical analysis, Microstructure.
Identifiers: *Internal waves.

The review emphasizes the space-time scales of internal waves in the sea, and the complex set of interrelations with microstructure. Mixing by breaking internal waves is briefly considered. A curious asymmetry is noted between the methods of observing microstructure in the oceans and atmosphere. (Author)

AD-768 994/6GA Reprint
Woods Hole Oceanographic Institution Mass
WIND-INDUCED BAROCLINIC MOTIONS AT THE EDGE OF THE CONTINENTAL SHELF.
Technical rept.,
G. T. Csanady. 9 Apr 73, 10p Rept nos. WHOI-73-61, WHOI-Contrib-2644
Contract N00014-66-C-0241
Revision of report dated 19 Feb 73.
Availability: Pub. in the Jnl. of Physical Oceanography, v3 n3 p274-279 Jul 73.

Descriptors: (*Continental shelves, *Ocean currents), Wind, Terrain.
Identifiers: Upwelling, Air water interactions.

In a two-layer model of stratified fluid flow, motions in the internal mode are governed by the distribution of an equivalent depth he. For a typical continental shelf, the distribution of he with distance from shore may be closely approximated by two straight-line distributions patched at the shelf break, one of constant slope and one of constant (equivalent) depth. For such a simple model the forced response to a suddenly imposed wind stress (in the internal mode) is easily calculated. The component of the wind stress 20. perpendicular to shore produces a step-like feature of the thermocline at the shelf, and a longshore Ekman drift gradually reducing to zero at the coast from the infinite ocean value far offshore. Wind stress parallel to the shore produces a thermocline step and a longshore jet at the shelf break, both of linearly increasing amplitude (in time), and an onshore or offshore Ekman drift, again reducing to zero at the coast but having the infinite-ocean magnitude far offshore. (Author)

AD-769 044/9GA Reprint
National Science Foundation Washington D C Div of Environmental Sciences*
SEASONAL VARIABILITY OF THE FLORIDA CURRENT,
Pearn P. Niiler, and William S. Richardson. 1 May 73, 26p
Sponsored in part by National Science Foundation and Office of Naval Research.
Availability: Pub. in Sears Foundation: Jnl. of Marine Research, v31 n3 p144-167, 15 Sep 73.

Descriptors: (*Ocean currents, *Florida Strait), Periodic variations, Numerical analysis, Thermoclines, Density, Heat transfer, Correlation techniques.

The seasonal variability of the directly measured transport and horizontal currents in the Florida Strait has been determined from 90 transects of the Florida Current at the latitude of Miami, Florida. It is estimated that the seasonal variability accounts for 45% of the total variability in the total transport. The seasonal change in the sea level across the Florida Strait is computed from the geostrophically balanced surface velocity and is found to have an amplitude of 6.5 cm. A much smaller (1.3 cm) corresponding seasonal amplitude in the steric level with respect to the ocean bottom has been observed, and the seasonal changes in the sea level are directly related to the seasonal changes in the dynamically induced pressure on the ocean floor. The seasonal changes of the transport in the Florida Strait penetrate to the ocean bottom. The annual cycle of heat transport also is discussed. (Modified author abstract)

AD-769 076/1GA PC$8.25/MF$1.45
Florida Univ Gainesville Coastal and Oceanographic Engineering Lab
INVESTIGATION OF THE VELOCITY FIELD OVER WAVES USING A WAVE FOLLOWER.
Technical rept.,
O. H. Shemdin, and R. J. Lai. Jun 73, 124p Rept no. TR-18
Contract DACW72-71-C-0020, Grant NSF-GK-31205

Descriptors: (*Water waves, Turbulence), Wind, Wind tunnels, Anemometers, Spectrum analyzers, Shear stresses.
Identifiers: Phase velocity, *Air water interactions, Surface waves, Turbulent flow.

The turbulent velocity field over simple propagating waves is investigated by hot-film sensors in a wind and wave facility. Use is made of a wave follower to obtain measurements below the wave crest level. Turbulence measurements are obtained in a wave following frame over the range 1.75 - 25 cm above the instantaneous water level. The measurements are transformed to an Eulerian frame and compared to measurements obtained from fixed probes over a height range 10-50 cm above the mean water level. In the overlap region the transformed wave following results are in reasonable agreement with the fixed probes results. The measurements below the crest level indicate rapid variations in Reynolds stresses and wave induced velocities. The results suggest nonlinear wave induced perturbations close to the water surface and reveal weaknesses in assumptions adopted in recent theoretical models of turbulent shear flows over waves. (Author)

COM-73-11690/7GA PC$3.00/MF$1.45
North Carolina State Univ., Raleigh. Dept. of Civil Engineering.
COMPUTATION OF FLOW THROUGH MASONBORO INLET, N.C.,
Michael Amein. Jul 73, 49p UNC-SG-73-15 NOAA-73092401
Contract NOAA-2-35178, Grant NOAA-043-158-40

Descriptors: (*Masonboro Inlet, Open channel flow), (*Open channel flow, Mathematical models), Numerical analysis, North Carolina, Partial differential equations, Coasts, Fluid dynamics, Inlets(Waterways), Estuaries, Coasts, Unsteady flow, Finite difference theory.
Identifiers: Sea Grant program.

The Masonboro Inlet system is a complex arrangement of channels connecting the coastal waterways to the Atlantic Ocean. The flow through the system was computed by means of a numerical simulation model based on the equations of unsteady flow which represent the laws for the conservation of mass and momentum. An implicit method was used to find the solutions for the finite difference equations. The method requires that the basic equations be satisfied at all locations simultaneously. A comparison of the computed results with the field observations demonstrates the accuracy, reliability, and efficiency of the method. It is believed that the simulation model can handle other inlets, which are generally much simpler than the Masonboro Inlet, with little difficulty. (Author)

COM-73-11745/9GA PC$4.25/MF$1.45
Texas A and M Univ., College Station. Coastal, Hydraulic, and Ocean Engineering Group.
EXPERIMENTAL STUDIES OF BEACH SCOUR DUE TO WAVE ACTION,
Won Oh Song, and Robert E. Schiller. Jul 73, 106p COE-166, TAMU-SG-73-211 NOAA-73100110
Grant NOAA-043-158-18, Contract NOAA-2-35213

Descriptors: (*Ocean waves, *Beach erosion), Standing waves, Regression analysis, Reflection, Sea walls, Shallow water, Correlation techniques, Experimental data.
Identifiers: Sea Grant program, *Beach scour.

A series of experiments was conducted to investigate the processes involved in the formation of beach scour, caused by wave action, on a natural beach and a seawall beach. The studies also took into account the determination of the reflection coefficient which characterized the wave reflected from both the seawall and the deformed beach profile. The standing wave, formed by the reflection of the waves, was found to be important in the analysis of beach scour phenomena. The linear standing wave theory was compared with the second order standing wave theory. The wave surface profile and the corresponding horizontal and vertical velocity components of the water particles at the designated points on the free water surface were calculated on the basis of the two theories. The results of the comparisons indicate that the linear standing wave theory gives good results as a first approximation; therefore, it was used in this study. To predict the scour depth on the natural beach and the seawall beach, regression analyses were performed. The results gave excellent correlation. (Modified author abstract)

COM-73-11789/7GA Reprint
Rhode Island Univ., Kingston. Graduate School of Oceanography.
GULF STREAM EDDIES: RECENT OBSERVATIONS IN THE WESTERN SARGASSO SEA,
P. L. Richardson, A. E. Strong, and J. A. Knauss. 22 Jan 73, 6p NOAA-73092721
Contract N00014-68-A-0215-0003
Revision of report dated 15 Dec 72.
Pub. in Jnl. of Physical Oceanography, v3 n3 p297-301 Jul 73.

Descriptors: (*Eddies, *Sargasso Sea), Spaceborne photography, Atlantic Ocean, Infrared photography, Turbulent flow, Ocean currents.
Identifiers: *Gulf Stream.

A cyclonic Gulf Stream eddy was observed in the western Sargasso Sea by satellite infrared measurements and later confirmed by ship measurements. Fourteen months of observations indicate that the eddy moved southwestward at an average rate of 1 mi/day. The evidence suggests that the eddy was absorbed by the Gulf Stream off Florida. (Author)

COM-73-11807/7GA Reprint
Rhode Island Univ., Kingston. Graduate School of Oceanography.
GULF STREAM EDDIES: RECENT OBSERVATIONS IN THE WESTERN SARGASSO SEA,
P. L. Richardson, A. E. Strong, and J. A. Knauss. 22 Jan 73, 6p NOAA-73100108
Contract N00014-68-A-0215-0003
Prepared in cooperation with National Environmental Satellite Service, Washington, D.C. Revision of report dated 15 Dec 72. National Ocean Survey.
Pub. in Jnl. of Physical Oceanography, v3 n3 p297-301 Jul 73.

Descriptors: (*Ocean currents, Sargasso Sea), Eddies, Remote sensing, Infrared detection.
Identifiers: *Gulf stream.

A cyclonic Gulf Stream eddy was observed in the western Sargasso Sea by satellite infrared measurements and later confirmed by ship measurements. Fourteen months of observations indicate that the eddy moved southwestward at an average rate of 1 mi/day. The evidence suggests that the eddy was absorbed by the Gulf Stream off Florida. (Author)

COM-73-50871/5GA MF$1.45
National Ocean Survey, Rockville, Md.
TIDAL CURRETN TABLES - 1974. ATLANTIC COAST OF NORTH AMERICA.
1973, 212p NOAA-73092501
Paper copy available from National Ocean Survey, Rockville, Md. 20852, $2.00.

Descriptors: (*Ocean tides, Mathematical prediction), Tables(Data), Meteorological data, Oceanographic data, Gulf Stream, Atlantic Ocean, Vineyard Sound, Nantucket Sound, East River, Delaware Bay, Chesapeake Bay.
Identifiers: Boston Harbor, New York Harbor.

The issue provides tabulated data on tidal currents for 1974 on the Atlantic Coast of North America. Tables show: daily current predictions; current differences and other constants; velocity of current at any time; duration of slack; and rotary tidal currents. Information is also given on the Gulf Stream, wind-driven currents, and the combination of currents. Current diagrams for the following areas are included: Boston Harbor; Vineyard and Nantucket Sound; East River, New York; New York Harbor; Delaware Bay and River; and Chesapeake Bay.

COM-73-50872/3GA MF$1.45
National Ocean Survey, Rockville, Md.
TIDE TABLES HIGH AND LOW WATER PREDICTIONS - 1974. CENTRAL AND WESTERN PACIFIC OCEAN AND INDIAN OCEAN.
1973, 390p NOAA-73092804
Paper copy available from National Ocean Survey, Rockville, Md. 20852, $2.00.

Descriptors: (*Ocean tides, Mathematical prediction), Tables(Data), Sea level, Moon, Declination, Navigational aids, Weather forecasting, Pacific Ocean, Indian Ocean.

The edition of the Tide Tables, Central and Western Pacific Ocean and Indian Ocean contains full daily predictions for 74 reference stations and differences and other constants for about 1,900 stations. It contains also a table for obtaining the approximate height of the tide at any time, a table of local mean time of sunrise and sunset for every fifth day of the year for different latitudes, a table for the reduction of local mean time to standard time, and a table of the Greenwich mean time of the moon's phases, apogee, perigee, greatest north and south and zero declination, and the time of the solar equinoxes and solstices.

LA-5146/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
NUMERICAL CALCULATION OF SURFACE WAVES: A MODIFIED ZUNI CODE WITH SURFACE PARTICLES AND PARTIAL CELLS.
A. A. Amsden. May 73, 18p
Contract W-7405-eng-36

Descriptors: (*Tsunamis, *Wave propagation), (*Incompressible flow, *Analytical solution), Boundary conditions, Seas, Stresses, Surfaces.

For abstract, see NSA 28 08, number 20575.

PB-224 516/5GA PC$4.00/MF$1.45
Hawaii Inst. of Geophysics, Honolulu.
A NEW METHOD FOR DETERMINING NORMAL MODES OF IRREGULAR BODIES OF WATER WITH VARIABLE DEPTH,
Harold G. Lommis. Jun 73, 39 HIG-73-10
NSF/IDOE-73-35
Grant NSF-AG-253
Prepared in cooperation with National Oceanic and Atmospheric Administration, Honolulu, Hawaii. Joint Tsunami Research Effort. Rept. no. NOAA-JTRE-86.

Descriptors: (*Ocean waves, Shallow water), Partial differential equations, Computer programs, Modulation, Numerical integration, Wave equations, Bathymetry.

The report supersedes a previous one (Loomis 1970) on finding normal modes of irregular bodies of water with variable depth. The method described here improves upon that described in the earlier report. First, the present method ensured that the matrix corresponding to the differential operator is symmetric, guaranteeing that eigenvalues are real and allowing use of the many available computing techniques suitable for symmetric matrices. Also, only half the matrix need be stored, thereby saving on storage space. Second, the boundary conditions phi = zero or (phi sub n) = zero are satisfied in a natural way without the assignment of grid points outside the boundaries of the water, as was necessary previously. Finally, the numerical code comes in a neat package, to which the user need add only the bathymetry of the water (with water depths of zero assigned at land areas) and certain parameters of the grid, and specify the type of output desired. An additional

output possible from the code is a contour map of the normal modes.

PB-224 527/2GA PC$3.00/MF$1.45
Hawaii Inst. of Geophysics, Honolulu.
SPEED OF THE SOLITARY WAVE,
Ellen R. Spielvogel, and Lester Q. Spielvogel. Jun 73, 16p HIG-73-2 NSF/IDOE-73-34
Grant NSF-AG-253
Prepared in cooperation with National Oceanic and Atmospheric Administration, Honolulu, Hawaii. Joint Tsunami Research Effort. Rept. no. NOAA-JTRE-67.

Descriptors: (*Ocean waves, Shallow water), Water waves, Hydrodynamics, Mathematical models, Velocity, Equations of motion.

An exact relationship between the speed of a solitary wave and its decay at infinity is derived. It is then compared to the existing shallow water theory as an indication of the merits of the theory in describing the solitary wave at points distant from the crest. (Author)

PB-224 603/1GA PC$3.00/MF$1.45
Hawaii Inst. of Geophysics, Honolulu.
SPEED OF SOLITARY WAVE,
Ellen R. Spielvogel, and Lester Q. Spielvogel. Jun 73, 15p HIG-73-2 NOAA-JTRE-67, NSF/IDOE-73-46
Grant NSF-AG-253

Descriptors: (*Ocean waves, Equations of motion), Shallow water, Reflection, Differential equations, Velocity.
Identifiers: *Solitary waves.

An exact relationship between the speed of a solitary wave and its decay at infinity is derived. It is then compared to the existing shallow water theory as an indication of the merits of the theory in describing the solitary wave at points distant from the crest. (Author)

PB-224 613/0GA PC$4.00/MF$1.45
Hawaii Inst. of Geophysics, Honolulu.
A NEW METHOD FOR DETERMINING NORMAL MODES OF IRREGULAR BODIES OF WATER WITH VARIABLE DEPTH,
Harold G. Loomis. Jun 73, 38p HIG-73-10 NOAA-JTRE-86, NSF/IDOE-73-47
Grant NSF-AG-253

Descriptors: (*Water waves, Shallow water), Bathymetry, Computer programs, Bays, Oceans, Depth finding, FORTRAN.
Identifiers: FORTRAN 4 programming language.

The report supersedes a previous one (Loomis 1970) on finding normal modes of irregular bodies of water with variable depth. The method described here improves upon that described in the earlier report. First, the present method ensures that the matrix corresponding to the differential operator is symmetric, guaranteeing that eigenvalues are real and allowing use of the many available computing techniques suitable for symmetric matrices. Also, only half the matrix need be stored, thereby saving on storage space. Second, the boundary conditions Phi = Zero or PHI(n) = Zero are satisfied in a natural way without the assignment of grid points outside the boundaries of the water, as was necessary previously. Finally, the numerical code comes in a neat package, to which the user need add only the bathymetry of the water (with water depths of zero assigned at land areas) and certain parameters of the grid, and specify the type of output desired. An additional output possible from the code is a contour map of the normal modes.

PB-224 616/3GA PC$4.75/MF$1.45
Washington Univ., Seattle. Dept. of Oceanography.
COASTAL UPWELLING ECOSYSTEMS ANALYSIS. TECHNICAL REPORT 3. PHYSICAL OCEANOGRAPHIC OBSERVATIONS MADE BY THE PACIFIC OCEANOGRAPHIC LABORATORY OFF THE OREGON COAST DURING JULY AND AUGUST 1972,
David Halpern, James R. Holbrook, and Michael Reynolds. Jul 73, 159p Ref-M73-46 NSF/IDOE-73-36
Grant NSF-AG-299

Descriptors: (*Upwelling, Physical oceanography), (*Ocean currents, Measurement), Oregon, Continental slopes, Continental shelves, Coasts, Recording systems, Temperature, Salinity, Statistical data, Data processing, Instruments, Depth, Oceanographic data.
Identifiers: Newport(Oregon).

During July and August 1972 the Pacific Oceanographic Laboratory (POL) participated in a multi-institutional coastal upwelling experiment that occurred off the coast of Oregon in the vicinity of Newport. The central scientific objective of this field experiment, which has been called CUE-1 (Coastal Upwelling Experiment), was an investigation of the three-dimensional (zonal, vertical and time) mesoscale physical dynamics of coastal upwelling. During CUE-1 the POL made measurements of the circulation near the surface by means of an instrumented mooring and, using an STD recorder, made measurements of the distribution of temperature and salinity over the continental shelf and slope regions. In this report, the authors present the data collected by the POL. Summaries of moored current meter and temperature measurements recorded near the sea surface on the continental shelf near Newport, Oregon are presented in computer-generated output as standard statistics, histograms, time series plots, progessive vector diagrams and spectra. Also, zonal distributions of density computed from salinity, temperature and depth measurements and anchor station summaries are given.

8D. Geochemistry

COO-3462-11/GA PC$3.00/MF$1.45
Rensselaer Polytechnic Inst., Troy, N. Y.
URANIUM GEOCHEMISTRY IN CARBONATES USING THE FISSION-TRACK METHOD. TECHNICAL PROGRESS REPORT.
D. S. Miller, and G. M. Friedman. 1973, 10p
Contract AT(11-1)-3462

Descriptors: (*Uranium, *Geochemistry), Calcium, Carbonates, Diagenesis, Distribution, Fission tracks, Magnesium, Potassium, Quantitative chemical analysis, Sediments, Sodium, Strontium, Trace amounts.

For abstract, see NSA 28 07, number 15464.

PB-224 785/6GA PC$3.00/MF$1.45
Geological Survey, Denver, Colo.
COMPUTER PROGRAM FOR SELECTIVE RETRIEVAL OF DATA FROM A STANDARD (FORMATTED) STATPAC TAPE.
Computer contribution,
Margaret R. Roberts. 1973, 43p USGS-CCD-73-002

Descriptors: (*Geochemistry, Information retrieval), (*Information retrieval, *Computer programs), Magnetic tapes, FORTRAN, Geology, Geophysics.
Identifiers: STATPAC system, FORTRAN 4 programming language, IBM 360/65 computers.

The report presents a FORTRAN 4 computer program that may be used to produce a table of all or a selected set of samples from a magnetic tape called a standard formatted STATPAC tape and generated from the STATPAC system of the U.S. Geological Survey. (Author)

8E. Geodesy

AD-768 610/8GA PC$3.00/MF$1.45
Defense Mapping Agency Aerospace Center St Louis Mo Technical Translation Branch
ON THE SUBSTANTIATION OF ONE METHOD FOR DETERMINING THE FIGURE OF THE EARTH (DO OBHRUNTUVANNYA ODNOHO METODU VIZNACHENNYA FIHURY ZEMLI),
I. F. Monin. Sep 73, 10p Rept no. DMAAC-TC-1971
Trans. of Akademiya Nauk URSR, Kiev. Dopovidi. Seriya B: Geologiya, Geofizyka, Khimiya ta Biologiya, n3 p233-236 1973, by George Synenko.

Descriptors: (*Gravity, Measurement), Anomalies, Mathematical models, Special functions(Mathematical), USSR.
Identifiers: Translations, *Gravimetric geodesy, Geoids, Earth measurement, Gravity anomalies, Spherical harmonics.

A closed formula is suggested for determining the earth's figure by means of the gravity anomalies and their derivatives without an assumption of the analytical continuation of the outer gravitational field. The derivatives of the gravity anomalies are computed by the anamolous vertical gravity gradients and the inclination angles of the earth's topographic surface. In the demonstration of the closed formula spherical functions were used. It is considered insufficiently substantiated. A demonstration of the formula without spherical functions is presented, and also a verification of this formula for one partial case is performed on the corresponding model.

AD-768 971/4GA PC$3.50/MF$1.45
Dba Systems Inc Melbourne Fla
INVESTIGATION OF THE FEASIBILITY OF A SHORT ARC REDUCTION OF SATELLITE ALTIMETRY FOR DETERMINATION OF THE OCEANIC GEOID.
Final rept. Jan 72-Aug 73,
Duane C. Brown. Aug 73, 58p AFCRL-TR-73-0520
Contract F19628-72-C-0085

Descriptors: (*Gravity, Earth models), (*Scientific satellites, Orbital trajectories), Satellite tracking systems, Numerical methods and procedures, Feasibility studies.
Identifiers: *Satellite altimetry, Geodetic satellites, *Geoids, GEOS C satellite.

A short arc approach to the determination of the oceanic geoid from observations made by a satellite-borne radar altimeter entails the recovery of geoidal parameters simultaneously with the recovery of weakly constrained orbital state vectors defining a very large number (i.e., thousands) of independent, interlocking short arcs (arcs typically 1/6 to 1/8 revolution in length). Patterned characteristics of the normal equations make such a simultaneous solution possible, no matter how many sets of orbital parameters are to be recovered. Computer simulations demonstrate that the approach is strongly determinate and can reasonably be expected to produce an oceanic geoid having an rms accuracy approaching one meter from the reduction of GEOS C observations. The major advantage offered by the short arc approach is that it in no way depends on the establishment of a highly accurate reference orbit and thus places only minimal requirements on satellite tracking by external systems. An additional advantage is that observational residuals can be expected to be relatively uncompromised by orbital biases. (Modified author abstract)

AD-768 973/0GA PC$5.25/MF$1.45
Ohio State Univ Columbus Dept of Geodetic Science

APPLICATION OF KINEMATICAL GEODESY FOR DETERMINING THE SHORT WAVE LENGTH COMPONENTS OF THE GRAVITY FIELD BY SATELLITE GRADIOMETRY.
Scientific interim rept.,
George B. Reed. Mar 73, 178p Rept nos. DGS-201, Scientific-9 AFCRL-TR-73-0535
Contract F19628-72-C-0120

Descriptors: (*Gravity, Measurement), Scientific satellites, Magnetometers, Harmonic analysis.
Identifiers: *Geodesy, Gravimetric geodesy, Spherical harmonics.

The report describes an investigation into the use of satellite borne gravity gradient devices for the recovery of terrestrial gravity information in terms of discrete mean gravity anomalies, point masses or potential coefficients. Simulation studies were conducted considering two possible instrument configurations: (1) a hand-mounted system capable of sensing five independent components of the gravity gradient tensor and (2) a rotating gravity gradient system. The spatial partial derivatives of a gravitational potential are developed using the methods of tensor calculus with specialization to the potential in spherical harmonics. A method is presented for estimating the root mean square magnitudes of all components of the gravity gradient tensor. The resulting estimates and the simulated solutions for the hard-mounted system strongly indicate that the measuring sensitivities required for the cross-gradient terms are beyond practical limits for satellite gradiometers. In addition, the effect of altitude attenuation on the gradients was evaluated. (Modified author abstract)

AD-769 095/1GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
GRAVIMETRIC INDIAN OCEAN GEOID,
H. G. Kahle, and M. Talwani. 4 Jan 73, 33p Rept no. LDGO-1959
Contract N00014-67-A-0108-0004, Grant NSF-GA-27281
Availability: Pub. in Zeitschrift fuer Geophysik, v39 p167-187 and p491-499 Apr and Jun 73.

Descriptors: (*Gravity, *Indian Ocean), Anomalies, Maps, Tables.
Identifiers: Gravimetric geodesy, *Geoids, Free air gravity anomalies.

The free Air Gravity maps of the Indian Ocean are used to obtain average free-air gravity values over (1x1 degree) squares. These values are then used to compute the gravimetric (1x1 degree) geoid over the Indian Ocean. As expected substantially more information is present in the shorter wavelength in this geoid than in the Gaposohkin and Lambeck (1970,1971) geoid obtained primarilly from data based on satellite observations. The largest differences between the two geoids are observed over the Madagascar Ridge (+23m)and over the deep sea trenches of the Indonesian Island Arc(-25m). The additional short wavelength information can be associated with physiographic features in the Indian Ocean. (Modified author abstract)

COM-73-11790/5GA Reprint
National Ocean Survey, Rockville, Md.
THEORETICAL AND ACTUALLY OBTAINED ACCURACIES WITH THE METHOD OF GEOMETRIC SATELLITE TRIANGULATION,
H. H. Schmid. 1972, 28p NOAA-73092514
Pub. in Proceedings of the Symposium: Satellite and Terrestrial Triangulation, Graz, Austria, 1972 p11-37.

Descriptors: (*Geodetic satellites, *Triangulation), Geometric geodesy, Satellite tracking, Error analysis.

The principle of the method of geometric satellite triangulation is based on the combination of a large number of individual directions to satellites in a three-dimensional triangulation. The required satellite directions at the stations to be triangulated are obtained by interpolating the individual images of the chopped satellite trail into the framework of the star background present on the photograms. In conclusion it is noted that with a stable camera mount it is to be expected that the accuracy of the method of satellite triangulation computed from theoretical consideration can be almost realized. With an optimally dimensioned balloon satellite in a nominal circular orbit and a height of 1200-1500 km it should be possible to attain a mean positional point accuracy of plus or minus in a continental net. Such a net with its points spaced at distances of 300-500 km would be a suitable control frame for classical geodetic triangulations.

COM-73-11791/3GA Reprint
National Ocean Survey, Rockville, Md.
GEODESY,
Hellmut H. Schmid. 1973, 5p NOAA-73092513
Pub. in McGraw-Hill Yearbook Science and Technology 5p 1973.

Descriptors: (*Geodesy, Reviews), Geodetic satellites, Geometric geodesy, Triangulation, Celestial mechanics.
Identifiers: PAGEOS satellite.

This is a study on the nature of geodesy and some of the current understandings in this field of learning. The advent of the satellite age provided the geodetic discipline with the necessary tools to solve its two principal tasks, essentially without any prejudicial hypotheses. Such measuring programs, using the methods of dynamic and geometric satellite geodesy, have been conducted during the past decade, and results have now become available. The method of dynamic satellite geodesy derives its results from the determination of the geometric configuration of the satellite's orbit as a function of time. The laws of celestial mechanics provide the theoretical basis for these solutions. Geometric satellite triangulation allows the determination of three-dimensional positions of points on the physical surface of the Earth by strictly geometric principles, that is, without reference to either the magnitude or the direction of the gravitational force vector. A brief reference to the PAGEOS satellite (Passive Geodetic Satellite) is included.

E73-11084/GA PC$3.00/MF$1.45
Rockwell International Corp., Thousand Oaks, Calif. Science Center.
IDENTIFICATION AND INTERPRETATION OF TECTONIC FEATURES FROM ERTS-A IMAGERY.
Progress rept. 1 Aug-30 Sep 73,
Monem Abdel-Gawad. 6 Oct 73, 4p NASA-CR-135552
Contract NAS5-2176/

Descriptors: Tectonics, Southern California, Earthquakes, Geological faults, Mexico, Earth resources program, Structural properties(Geology), Photointerpretation.

The author has identified the following significant results. When comparing the ERTS-1 imagery with the United States Air Force Operational Navigation Charts, mapping errors were found in Baja California and in the coastal islands off mainland Mexico. One dramatic error noted was the Isla Tortuga which is located 9 to 9.5 km to the west of its photo location. One ERTS-1 photo shows the size of the four islands, Isla San Juanito, Isla Maria Madre, Isla Maria Magdalena, and Isla Maria Cleofas, to be much smaller than the ONC map depicts them. A prominent zone of structural and physiographic lineaments extending approximately from San Fernando, Los Angeles County towards the Oxnard area in Ventura County in an east-northeast trend were observed. In Ventura County several previously unknown faults within this zone were identified and their traces plotted on large scale maps and 1:60,000 aerial photographs. This important fault zone is significant because it trends parallel to and partly coincides with a recent belt of seismicity related to the San Fernando 1971 earthquake.

JPRS-60183/GA PC$3.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
GYROSTABILIZED MARINE GRAVIMETER,
E. I. Popov. 2 Oct 73, 88p
Trans. of mono. Morskoi Girostabilizirovannyi Gravimeter, Moscow, 1972 p3-4, 23-49, 79-96, 138-150, 155-164.

Descriptors: (*Gravimeters, Design) Shipborne detectors, Gyrostabilizers, Instrument characteristics, Translations, USSR.

The report contains articles on the design, testing and use of gyrostabilized marine gravimeters.

N73-30338/0GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A SIMULATION OF THE SAN ANDREAS FAULT EXPERIMENT.
R. W. Agreen, and D. E. Smith. May 73, 43p
NASA-TM-X-70439, X-592-73-216
Subm-Submitted for Publication.

Descriptors: *California, *Geological faults, *Tectonics, Error analysis, Explorer satellites, Laser range finders, Simulation.

For abstract, see STAR 1121

N73-31350/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
POLAR MOTION AND EARTH TIDES FROM BEACON EXPLORER C.
D. E. Kolenkiewicz, D. E. Smith, and P. J. Dunn. May 73, 14p NASA-TM-X-70460, X-592-73-236
Subm-Submitted for Publication. Conf-Presented at the 1ST Intern. Symp. On the Use of Artificial Satellites for Geodesy and Geodynamics, Athens, May 1973.

Descriptors: *Earth tides, *Explorer satellites, Inclination, Perturbation, Polar orbits, Statistical analysis.

For abstract, see STAR 1122

N73-31365/2GA PC$6.25/MF$1.45
Smithsonian Astrophysical Observatory, Cambridge, Mass.
THE APPLICATION OF VLB INTERFEROMETRY TO EARTH MEASUREMENTS.
Final Report.
R. D. Michelini. Apr 73, 84p NASA-CR-135493
Contract NSR-09-015-079

Descriptors: *Astrophysics, *Geophysics, *Interferometry, Artificial satellites, Computer programs, Earth (Planet), Errors.

For abstract, see STAR 1122

8F. Geography

AD-768 459/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE NATURAL MEDIUM AND SPACE,
Kirill Yakovlevich Kondratev. 10 Oct 73, 19p Rept no. FTD-MT-24-704-73
Edited machine trans. of Kirill Yakovlevich, Nr. 5, 1972, pp. 169-183(sic), by Michael L. Seidel.

Descriptors: (*Geography, Aerial photography), Spaceborne, Photographic techniques, Hydrology, Oceanology, Mapping, Meteorological parameters, Multiband spectral reconnaissance, USSR.

Identifiers: Translations, *Remote sensing, Spaceborne photography.

The article reviews use of scientific satellites on the remote sensing of earth events from space.

N73-30137/6GA PC$4.00/MF$1.45
Purdue Univ., Lafayette, Ind. School of Civil Engineering.
GEOMETRIC ASPECTS IN DIGITAL ANALYSIS OF MULTI-SPECTRAL SCANNER (MSS) DATA.
E. M. Mikhail, and J. R. Baker. 1973, 37p NASA-CR-133641, LARS-042573
Contract NGL-15-005-112

Descriptors: *Digital techniques, *Multispectral band scanners, *Remote sensors, Aerospace vehicles, Collinearity, Flying platforms, Mapping, Polynomials, Stabilized platforms, Sweep angle, Topography, Transformations (Mathematics).

For abstract, see STAR 1121

N73-30330/7GA PC$3.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
APPLICATIONS SATELLITES: LEGAL ASPECTS. PART 2: THE REMOTE SENSING OF EARTH RESOURCES BY SATELLITES.
A. Tchernonog. Aug 73, 18p NASA-TT-F-15055
Contract NASW-2483
Tran-Transl. Into English from Rech. Spatial (France), V. 12, No. 3, 1973 p 1-5.

Descriptors: *International cooperation, *Remote sensors, *Satellite transmission, Data acquisition, Earth resources, Space law.

For abstract, see STAR 1121

N73-30975/9GA PC$5.50/MF$1.45
Centre de Recherches en Physique des Plasmas, Lausanne (Switzerland).
BIBLIOGRAPHIC COMPILATION AND TABULATION OF RESOURCES, OF THEIR CONSUMPTION AND THEIR WASTE IN THE WORLD COMPILATION BIBLIOGRAPHIQUE ET TABULATION DES RESSOURCES, DE LA CONSOMMATION ET DES DECHETS DANS LE MONDE.
M. Roux. Jul 73, 66p LRP-63/73
In French; English Summary.

Descriptors: *Bibliographies, *Earth resources, *Energy requirements, *Fuels, Electric power plants, Fuel consumption, Nuclear fuels, Solar energy.

For abstract, see STAR 1122

PB-224 673/4GA PC$13.75/MF$1.45
Earth Satellite Corp., Washington, D.C.
EVALUATION OF ECONOMIC, ENVIRONMENTAL AND SOCIAL COSTS AND BENEFITS OF FUTURE EARTH RESOURCE SURVEY SATELLITE SYSTEMS.
Quarterly progress rept. no. 1, Feb-Apr 73.
14 May 73, 234p USGS-DO-73-010
Contract DI-14-08-001-13519

Descriptors: (*Natural resources, Environmental surveys), (*Environmental surveys, Scientific satellites), Economic analysis, Benefit cost analysis, Management engineering, Agriculture, Forestry, Mineral deposits, Land use, Water resources, Wildlife, Fisheries.
Identifiers: ERTS-1 satellite, Data management systems.

Initial effort to analyze the economic, environmental, and social costs and benefits of future earth resource survey satellite systems has been to identify user requirements through a review of previous studies, identify earth resources survey information of value to application areas through a review of all ERTS-1 experiment information, to identify and describe user decisions and actions which are or might be influenced by earth resources survey data, particularly in the fields of agriculture and water resources, and to develop recommendations of case studies to be used later.

SGAE-2130/GA PC$3.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf.
COMPUTER PROGRAMS FOR EVALUATING CAVE MEASUREMENTS.
F. Buschbeck, and G. Pethers. May 73, 14p
In German. U.S. Sales Only.

Descriptors: (*Caves, *Maps), Computer codes, Fortran, Topography.

For abstract, see NSA 28 08, number 20584.

8G. Geology and Mineralogy

AAEC/LIB/Bib-378/GA PC$8.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
NUCLEAR ANALYSIS IN GEOLOGY AND GEOCHEMISTRY. A BIBLIOGRAPHY.
E. A. Newland. Mar 73, 117p
U.S. Sales Only.

Descriptors: (*Geology, *Bibliographies), (*Geochemistry, Bibliographies), (*Activation analysis, Bibliographies), Boreholes, Neutron beams, Well logging.

For abstract, see NSA 28 08, number 17842.

AD-768 534/0GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
COMPOSITIONAL IMPLICATIONS OF CHRISTIANSEN FREQUENCY MAXIMUMS FOR INFRARED REMOTE SENSING APPLICATIONS,
Lloyd M. Logan, Graham R. Hunt, John W. Salisbury, and Salvatore R. Balsamo. 16 Feb 73, 22p Rept no. AFCRL-TR-73-0589
Revision of report dated 14 Aug 72.
Availability: Pub. in Jnl. of Geophysical Research, v78 n23 p4983-5003, 10 Aug 73.

Descriptors: (*Rock forming minerals, *Infrared spectroscopy), (*Silicates, Infrared spectroscopy), Particle size, Spectrum analyzers, Temperature, Pressure.
Identifiers: Remote sensing, Mineralogy, Emission spectra, Lunar geology.

Use of maximums in the infrared emission of particulate surfaces for compositional remote sensing is a recent development that has not been thoroughly investigated. It is shown that experimental conditions, such as particle size and packing, background temperature, atmospheric pressure, and uniformity of sample heating, all affect the wavelength of the emission maximum and the contrast of the spectrum. These effects emphasize the necessity for laboratory study of emission spectra under conditions which simulate the remote environment to provide appropriate information for correctly deciphering remote sensing data. When experimental conditions are held constant, simulating those on the moon, emission maximums are shown to be diagnostic of rock type. (Author)

AD-768 639/7GA Reprint
Naval Undersea Center San Diego Calif
MARINE GEOLOGY OF THE ALEUTIAN ABYSSAL PLAIN,
Edwin L. Hamilton. 12 Feb 73, 33p
Availability: Pub. in Marine Geology, v14 p295-325 1973.

Descriptors: (*Marine geology, *Alaska Gulf), (*Ocean bottom, Alaska Gulf), Sedimentation, Ocean bottom topography, Geologic age determination.
Identifiers: Submarine plains, Tectonics, Seamounts, Bathymetry.

Five expeditions (1965-1970) across parts of the Aleutian Abyssal Plain and adjacent areas in the Gulf of Alaska, and results of the Deep Sea Drilling Project, provide new information for the geologic history of the region which forms restrictive limits on models of plate tectonics. In general: (1) the Eocene-Oligocene, turbidite Aleutian Abyssal Plain was deposited from channelized turbidity currents from the north or northeast; (2) the plain is bounded on the south by the northern ridges of the Surveyor Fracture Zone, and is isolated from the Tufts Abyssal Plain; (3) turbidites were deposited from many buried channels and smaller surficial channels, but mainly from four great channels: Seamap, Sagittarius, Aquarius, and Taurus.

AD-768 648/8GA PC$5.50/MF$1.45
Ohio State Univ Research Foundation Columbus
FINITE ELEMENT ANALYSIS OF STRESSES, DEFORMATIONS AND PROGRESSIVE FAILURE OF NON-HOMOGENEOUS FISSURED ROCK. VOLUME I. MAIN DOCUMENT.
Final rept.,
Ranbir S. Sandhu. 31 Mar 73, 213p* Rept no. OSURF-3177-73-1F
Contract H0210017, ARPA Order-1579
See also report dated 30 Aug 71, AD-731 688. For magnetic tape see AD-768 651.

Descriptors: (*Rock(Geology), Mechanical properties), (*Underground structures, Stresses), Deformation, Elasticity, Plasticity, Fracture(Mechanics), Failure(Mechanics), Foundations(Structures), Construction, Mining engineering, Numerical analysis, Crack propagation, Mathematical prediction.
Identifiers: Finite element analysis, Rock mechanics, Excavation, Rock properties, Tunnels.

The objective of this research program was development of finite element procedures for prediction of stresses and deformations in the vicinity of underground excavation. Two models of rock behavior were selected. In one the rock is treated as isotropic elastic-plastic following a generalized Mohr-Coulomb law and in the other the rock is isotropic elastic-brittle subject to Griffith or modified failure theory. For each model, mathematical relationships governing stress-strain behavior and progressive failure were developed. Finite element computer programs incorporating each of the two models were coded. Preliminary to this development, a revised version of Zienkiewicz's no-tension analysis was programmed. The report contains the theoretical development, and discussion of application of the techniques to theoretical solutions, experimental data, published results and a parametric study of forces in structural supports for a tunnel excavation. (Modified author abstract)

AD-768 649/6GA PC$4.50/MF$1.45
Ohio State Univ Research Foundation Columbus
FINITE ELEMENT ANALYSIS OF STRESSES. DEFORMATIONS AND PROGRESSIVE FAILURE OF NON-HOMOGENEOUS FISSURED ROCK. VOLUME II. COMPUTER PROGRAMS USER'S MANUAL.
Final rept.,
Ranbir S. Sandhu. 31 Mar 73, 138p Rept no. OSURF-3177-73-2F
Contract H0210017, ARPA Order-1579
See also report dated 31 Mar 73, AD-768 650. Also included with AD-768 651 Mag Tape $250.00, Foreign $312.50.

Descriptors: (*Rock(Geology), Mechanical properties), (*Underground structures, Stresses), (*Computer programs, Instruction manuals), Min-

ing engineering, Construction, Deformation, Elasticity, Plasticity, Fracture(Mechanics), Failure(Mechanics), Foundations(Structures), Crack propagation, Mathematical prediction.
Identifiers: Finite element analysis, Rock mechanics, Rock properties, Excavation, Tunnels, FORTRAN, IBM 370/165 computers.

The objective of this research program was development of finite element procedures for prediction of stresses and deformations in the vicinity of underground excavation. The report contains descriptions, instructions for usage and fortran listing of computer programs used to obtain the numerical results presented and discussed in Volume one. (Modified author abstract)

AD-768 650/4GA PC$2.75/MF$1.45
Ohio State Univ Research Foundation Columbus
FINITE ELEMENT ANALYSIS OF STRESSES, DEFORMATIONS AND PROGRESSIVE FAILURE OF NON-HOMOGENEOUS FISSURED ROCK. VOLUME III. COMPUTER PROGRAMS.
Final rept.,
Ranbir S. Sandhu. 31 Mar 73, 12p Rept no. OSURF-3177-73-3F
Contract H0210017, ARPA Order-1579
See also report dated 31 Mar 73, AD-768 649. Also included with AD-768 651 Mag Tape $250.00, Foreign $312.50.

Descriptors: (*Rock(Geology), Mechanical properties), (*Underground structures, Stresses), Computer programs.
Identifiers: IBM 370/165 computers, FORTRAN.

The objective of this research program was development of finite element procedures for prediction of stresses and deformations in the vicinity of underground excavation. The report contains the layout sheet relating to computer programs used to obtain the numerical results presented and discussed in Volume one. (Modified author abstract)

AD-768 651/2GA
Mag Tape $250.00;Foreign $312.50
Ohio State Univ Research Foundation Columbus
FINITE ELEMENT ANALYSIS OF STRESSES, DEFORMATIONS AND PROGRESSIVE FAILURE OF NON-HOMOGENEOUS FISSURED ROCK - COMPUTER PROGRAMS ON MAGNETIC TAPE.
Final rept.,
Ranbir S. Sandhu. 31 Mar 73, 1 reel Rept no. OSURF-3177-73-3F
Contract H0210017, ARPA Order-1579
See also AD-768 648.
Availability: Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity. Includes AD-768 649 (Users Manual), and AD-768 650 (Computer Programs).

Descriptors: (*Rock(Geology), Mechanical properties), (*Underground structures, Stresses), (*Magnetic tape, Computer programs), Mining engineering, Foundations(Structures), Construction, Deformation, Elasticity, Plasticity, Crack propagation, Fracture(Mechanics), Failure(Mechanics).
Identifiers: FORTRAN, IBM 370/165 computers, Finite element analysis.

The objective of this research program was development of finite element procedures for prediction of stresses and deformations in the vicinity of underground excavation. The magnetic tape contains the computer programs written in FORTRAN for an IBM 370/165 computer. (Modified author abstract)

AD-768 653/8GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
OXYGEN ISOTOPE AND PALAEOMAGNETIC STRATIGRAPHY OF EQUATORIAL PACIFIC CORE V28-238: OXYGEN ISOTOPE TEMPERATURES AND ICE VOLUMES ON A 100,000 AND 1,000,000 YEAR SCALE,
Nicholas John Shackelton, and Neil D. Opdyke. 18 Jan 72, 18p Rept no. LDGO-1970
Contract N00014-67-A-0108-0004, Grant NSF-GA-29460
Availability: Pub. in Jnl. of Quaternary Research, v3 n1 p39-55 Jun 73.

Descriptors: (*Stratigraphy, *Pacific Ocean), Ocean bottom sampling, Geologic age determination, Radioactive isotopes, Oxygen, Carbonate minerals, Foraminifera, Terrestrial magnetism.
Identifiers: Paleomagnetism, Cores, *Paleoclimatology.

Core Vema 28-238 preserves an excellent oxygen isotope and magnetic stratigraphy and is shown to contain undisturbed sediments deposited continuously through the past 870,000 yr. Detailed correlation with sequences described by Emiliani in the Caribbean and Atlantic Ocean is demonstrated. The boundaries of 22 stages representing alternating times of high and low Northern Hemisphere ice volume are recognized and dated. The record is interpreted in terms of Northern Hemisphere ice accumulation, and is used to estimate the range of temperature variation in the Caribbean. (Author)

AD-768 654/6GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
TIME-TRANSGRESSIVE DEGLACIAL RETREAT OF POLAR WATERS FROM THE NORTH ATLANTIC,
W. F. Ruddiman, and A. McIntyre. 18 Jan 73, 16p Rept no. LDGO-1968
Contract N00014-67-A-0108-0004, Grant NSF-GA-19690
Availability: Pub. in Jnl. of Quaternary Research, v3 n1 p117-130 Jun 73.

Descriptors: (*Stratigraphy, *Atlantic Ocean), Foraminifera, Geologic age determination, Ocean bottom sampling.
Identifiers: *Paleoclimatology, Cores, North Atlantic Ocean.

A 9300 yr-old zone of disseminated volcanic ash in North Atlantic sediments between 45 degrees N and 65 degrees N provides a time-synchronous reference layer against which the authors have compared the stratigraphic level of deglacial warming of ocean surface waters. In the Atlantic north of 45 degrees N the most prominent feature of this warming is the replacement of low-carbonate glacial marine sediment containing only a single species of polar Foraminifera by calcareous oozes containing a diverse temperate fauna and flora. The local terminations of glacial conditions marked by this change are not synchronous at these latitudes, but range from 13,500 yr B.P. or older in the southeast near Great Britain to 6,500 yr B.P. or younger in the northwest near Greenland. Regionally, these local warmings trace the progressive westward and northward retreat of polar water from the North Atlantic. Since the withdrawal of polar water from the North Atlantic coincides with the northward shrinkage of temperate-latitude continental ice sheets, it is the best oceanic analog to continental deglaciation. (Modified author abstract)

AD-768 664/5GA Reprint
Hawaii Inst of Geophysics Honolulu
CONTEMPORARY PHOSPHORITES ON THE CONTINENTAL MARGIN OF PERU,
H. Herbert Veeh, William C. Burnett, and Andrew Soutar. 11 May 73, 3p Rept no. HIG-Contrib-522
Contract N00014-71-A-0016-0001
Prepared in cooperation with Scripps Institution of Oceanography, La Jolla, Calif. Revision of report dated 5 Mar 73.
Availability: Pub. in Science, v181-845, 31 Aug 73.

Descriptors: (*Phosphates, Peru), (*Continental shelves, *Sedimentary rock), Carbonate minerals, Geologic age determination, Sedimentation, Pacific Ocean.
Identifiers: Nonclastic rocks, Nodules, Undersea mineral deposits.

Phosphorite nodules occurring along the biologically productive continental margin of Peru have been dated by uranium-series methods. The radiometric ages range from late Pleistocene to Recent, indicating that phosphorites are currently forming in this area. (Author)

AD-768 724/7GA PC$3.50/MF$1.45
Georgia Inst of Tech Atlanta Engineering Experiment Station
ELECTROSEISMIC DETERMINATION OF SOIL AND ROCK TYPES.
Final rept.,
Leland Timothy Long, and Wayne K. Rivers. Sep 73, 63p Rept no. GIT-A-1124 AROD-7266:3-EN
Grant DA-ARO(D)-31-124-G-1060

Descriptors: (*Seismic waves, Resistance(Electrical)), (*Geophysical prospecting, Seismic waves), Numerical analysis, Stratigraphy, Electrical properties, Soil mechanics, Sedimentary rock, Georgia, Computer programs, Telluric currents.
Identifiers: Resistivity exploration, Seismic prospecting.

A numerical inversion technique was developed for resistivity data but found to be unsuitable for application to data with large errors or data which does not conform closely to the assumptions in the technique. The theoretical development is included since it contains some innovations concerning the modeling of the electrical response of a media with variable resistivity. A field program was carried out to test the feasibility of the measurement of the electroseismic effect. The electroseismic effect is defined in this report as the change in resistivity induced during the passage of seismic waves. Measurements were made in the Wenner configuration at a single location in recent coastal plane sediments of central Georgia. Voltage variations were recorded which could be correlated with the seismic arrivals from two pounds of explosives at about 250 feet. Using the theory developed in this report for its interpretation, the electrical response could be used to infer changes in resistivity at depth induced by seismic waves. Measurement of the electroseismic phenomenon is feasible but more research is needed to develop the interpretation theory and test the electroseismic response of different types of rocks.

AD-768 791/6GA PC$3.75/MF$1.45
Coastal Engineering Research Center Fort Belvoir Va
PLEISTOCENE-HOLOCENE SEDIMENTS INTERPRETED BY SEISMIC REFRACTION AND WASH-BORE SAMPLING, PLUM ISLAND-CASTLE NECK, MASSACHUSETTS.
Technical memo.,
Eugene G. Rhodes. Jul 73, 85p Rept no. CERC-TM-40

Descriptors: (*Seacoast, *Massachusetts), Sampling, Stratigraphy, Clay, Minerals, Estuaries, Beaches.
Identifiers: Seismic refraction, *Sediments, Coastal topographic features, Plum Island, Seismic profiles, Geomorphology.

The wash-bore method of soil sampling was found to be an excellent technique for subsurface study in coastal areas. Phenomena to be considered when interpreting seismic refraction records include (a) the 'blind zone', (b) the non-zero time intercept, (c) time gaps in the time-distance photo over buried peat, and (d) variable thicknesses of dry sand layers. The seismic method successfully located Pleistocene and bedrock topography. However, glaciomarine clay did not show a seismic contrast with respect to sandy, water-

soaked sediments. Topography exposed during lower sea level has a dominant influence on modern coastal geology. Barrier islands became anchored on Pleistocene features as the sea level rose and deposition occurred in the estuaries behind the barrier beaches. Major channels of the estuaries migrated landward with the sea-level rise. (Modified author abstract)

AD-768 793/2GA PC$10.00/MF$1.45
Delaware Univ Newark Coll of Marine Studies
A RECONNAISSANCE OF THE GEOLOGY OF THE SANDY COASTAL AREAS OF EASTERN GREECE AND THE PELOPONNESE--WITH SPECULATIONS ON MIDDLE-LATE HELLADIC PALEOGRAPHY (3000-4000 YEARS BEFORE PRESENT).
Technical rept.
John C. Kraft. Jul 72, 159p Rept nos. CMS-2GI-047, TR-9
Contract N00014-69-A-0407

Descriptors: (*Greece, *Seacoast), Terrain, Sedimentation, Stratigraphy, Erosion, History.
Identifiers: Geomorphology, Coasts, Archaeology, Sea level.

A compilation of field observations on coastal morphology in eastern Greece and the Peloponnese is presented. This study of coastal sedimentarry environments presents a plan for detailed analysis of rates of coastal change on the sandy coastal plains at the heads of the major embayments of the coast of southern and eastern Greece. Processes of coastal erosion and deposition are actively reforming the sandy coasts of Greece. A detailed understanding of rates of change of these coastal environments is of use in local construction and coastal protection problems as well as in forming an understanding of the paleogeography of coastal change and projection of future anticipated changes in coastal morphology. In addition, models of coastal change in sandy coastal plains bounded by rocky, cliff-lined embayments have been formed. These may prove to be useful in broader applications elsewhere. (Author)

AD-768 958/1GA PC$3.75/MF$1.45
Terra Tek Inc Salt Lake City Utah
MECHANICAL PROPERTIES OF NEVADA TEST SITE TUFFS FROM SELECTED EXPLORATORY DRILL HOLES.
Final rept.,
S. W. Butters, R. J. Reid, S. J. Green, and A. H. Jones. 21 Sep 73, 93p Rept no. TR-73-28 DNA-3181F
Contract DNA001-73-C-0017

Descriptors: (*Rock(Geology), Mechanical properties), (*Nuclear explosions, Site selection), Tables, Compressive properties, Strain(Mechanics), Moisture, Nevada, Tests.
Identifiers: *Tuff, Stress strain diagrams, *Rock mechanics, Poisson ratio.

Cores taken from selected exploratory holes at the Nevada Test Site were tested to determine the suitability of the location for a nuclear experiment. Tuff specimens were loaded/unloaded hydrostatically to four kilobars pressure. Additionally, both constant confining pressure and uniaxial strain tests were conducted. This report consolidates all the data previously reported separately for the different sites. (Modified author abstract)

AD-768 974/8GA PC$3.00/MF$1.45
Defence Research Information Centre Orpington (England)
THE DETERMINATION OF QUARTZ, TRIDYMITE AND CRISTOBALITE IN DINASIC BRICKS BY THE X-RAY DIFFRACTION METHOD (ROENTGENOGRAFICKE STANOVENIE KREMENA, TRIDYMITU A KRISTOBALITU V DINASOCH),
J. Corba. Oct 73, 10p Rept nos. DRIC-Trans-3308, DRIC-BR-30628
Trans. of Silikaty (Czechoslovakia) n4 p325-330 1972, by H. Tauber.

Descriptors: (*Silicon dioxide, *X-ray diffraction analysis), Czechoslovakia, Crystal structure, Quartz, Crystallography.
Identifiers: Translations, Polymorphism, Cristobalite, Tridymite.

The method involves the determination of the integral intensity of the spectra at a specified wavelength - 3.34A for quartz, 3.15A for cristobalite, and 3.81A for tridymite. The values for the integral intensities are obtained from the product of the line height and width at the half point of its height. Standard mixtures have been prepared from the three pure components, and eight samples have been analysed. Results are presented and discussed. (Author)

COM-73-11751/7GA Reprint
Wisconsin Univ., Madison. Sea Grant Underwater Minerals Program.
THE DISTRIBUTION OF TRACE METALS IN THE SURFICIAL SEDIMENTS SURROUNDING KEWEENAW POINT, UPPER MICHIGAN,
Peter A. Smith, and J. R. Moore. 1972, 13p WIS-SG-73-341 NOAA-73101004
Pub. in Proceedings of the Conference on Great Lakes Research (15th), p383-393 Apr 72.

Descriptors: (*Copper ore deposits, *Lake Superior), (*Trace elements, Lake Superior), (*Sediments, Lake Superior), Geochemistry, Copper, Zinc, Cobalt, Nickel, Tin, Shores, Keweenaw Peninsula.
Identifiers: Sea Grant program, Keweenaw Point(Michigan).

Surficial sediments around Keweenaw Point were collected during late August 1971. The trace metal data for the recovered sediment samples are presented. Determinations are based upon 54 atomic absorption analyses (perchloric acid extraction) for Cu, Zn, Co, Ni and Sn, using the minus 80 U.S. standard sieve mesh size fraction of the sediments. Indications are that two distinct areas are delineated by the results, separated from each other by the Keweenaw Fault trending east-west at a latitude of approximately 47 degrees 23 minutes north. (Modified author abstract)

COM-73-11764/0GA PC$2.75/MF$1.45
Wisconsin Univ., Madison.
UNDERWATER COPPER EXPLORATION IN LAKE SUPERIOR -- PROSPECTS MAPPED IN 1971,
J. R. Moore, R. P. Meyer, and R. J. Wold. 1972, 18p WIS-SG-73-338 NOAA-73101002
Pub. in Proceedings of Offshore Technology Conference, Dallas, Texas, 1-3 May 72, Preprint Paper no. OTC-1648.

Descriptors: (*Copper ore deposits, *Exploration), (*Lake Superior, Copper ore deposits), Zinc, Cobalt, Tin, Nickel, Geophysical surveys, Seismic profiles, Michigan, Keweenaw Peninsula.
Identifiers: Sea Grant Program.

The principal objective of this continuing investigation is to assess the potential for lode copper beneath the shallow waters surrounding the Keweenaw copper-producing district. Using Coast Guard ship support, approximately 1,000 track miles of (a) high resolution acoustic profiles, (b) intermediate depth air-gun seismic profiles, (c) continuous magnetometer records, and (d) some 20 dredge and grab samples of the bottom as well as coastal sediments and sub-lake rock exposures were collected. Subsequent to the cruise, the geophysical records have been under study, and all sediment and rock samples have been analyzed for copper, zinc, cobalt, tin and nickel. The mapped distribution of copper values, and to a lesser extent zinc, cobalt, nickel, do resemble haloes similar to those found around some producing districts on land and are encouraging. On the north side of the Keweenaw Peninsula, the copper trend is parallel to the coast, while on the south side, the copper anomalies extent normal to the coast. (Modified author abstract)

E73-11096/GA PC$3.25/MF$1.45
Environmental Research Inst. of Michigan, Ann Arbor.
SPECTRAL RATIO IMAGING METHODS FOR GEOLOGICAL REMOTE SENSING FROM AIRCRAFT AND SATELLITES,
Robert K. Vincent. Oct 73, 22p NASA-CR-135564
Contracts NAS5-21783 NAS9-9784, H0210041
Presented at the Management Utilization of Remote Sensing Data Conference, Sioux Falls, S. D., 31 Oct. 73.
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S. D. 57198. ERTS.

Descriptors: Multispectral band scanners, Geology, Photogrammetry, Wyoming, South Dakota, Earth resources program, Spectral reflectance, Iron compounds, Oxides.

The author has identified the following significant results. The production of ratio images from multispectral scanner data is described and several examples of ratio images from aircraft and ERTS-1 data are given for visible, reflective infrared, and thermal infrared wavelengths. The application of photogrammetric techniques to ratio images, defined for this paper as ratio scannergrammetry, is considerably aided by the lesser dependence of ratio images on atmospheric and solar illumination variations, compared with single channel scanner imagery or aerial photos. Ratio scannergrammetry is further aided by the proportionality between ratios of a target deduced from ratio images and ratios of reflectances calculated from laboratory spectra of samples from the target area. Consequently, ratios calculated from laboratory data can be used to predict which ratios are best for discriminating a given rock or mineral, to predict what other rocks or minerals will be confused with it, and finally, to place ratio scannergrammetry on an absolute basis, within an estimated standard error on the order of 5% to 10%. Examples of relative agreement between laboratory data and ratio images are given for two iron oxides, hematite and magnetite.

E73-11100/GA PC$3.00/MF$1.45
Geological Survey, Denver, Colo.
THERMAL SURVEILLANCE OF ACTIVE VOLCANOES.
Progress rept. 1 Apr-30 Jun 73,
Jules D. Friedman. 30 Jun 73, 4p NASA-CR-135569
Contract NASA Order S-70243-AG

Descriptors: Volcanoes, Thermal radiation, Cascade Range(CA-OR-WA), Infrared radiation, Earth resources program, Abnormalities, Volcanology, Craters, Geophysics.

The author has identifed the following significant results. There are three significant scientific results of the discovery of 48 pinpoint anomalies on the upper flanks of Mt. Rainier: (1) Many of these points may actually be the location of fumarolic vapor emission or warm ground considerably below the summit crater. (2) Discovery of these small anomalies required specific V/H scanner settings for precise elevations on Mt Rainier's flank, to avoid smearing the anomalies to the point of nonrecognition. Several past missions flown to map the thermal anomalies of the summit area did not detect the flank anomalies. (3) This illustrates the value of the aerial IR scanner as a geophysical tool suited to specific problem-oriented missions, in contrast to its more general value in a regional or reconnaissance anomaly-mapping role.

E73-11122/GA PC$3.00/MF$1.45
Lund Univ. (Sweden). Dept. of Physical Geography.
EVALUATION OF DATA UTILITY FOR EARTH SCIENCES FROM METHODICAL POINT OF VIEW.
Progress rept. Feb-Aug 73,
Harald Svensson. 10 Oct 73, 8p NASA-CR-135660

Descriptors: Sweden, Norway, Glacial drift, Earth resources program, Glaciology, Forests, Geological surveys.

The author has identified the following significant results. A very distinct line representing the Rasubstage of the last deglaciation period is observable around the outer parts of the Oslo fjord. The moraine line is also traceable in some parts of the forest district on the Swedish side of the border forming part of the Central Swedish End Moraines. In the area of Lake Vanern to the southeast, the line is then again more distinct, partly due to the cultivation pattern. Outside the Central Swedish Moraine Line and nearer to the coast another not so distinct moraine line could be observed running NNW-SSE. This line crosses the coastline before reaching the Oslo fjord. Probably the moraine deposits on some outer islands in the fjord constitute part of this older moraine line. The study will be extended to districts of southern Sweden, where old moraine lines of the last deglaciation period are incompletely mapped.

E73-11151/GA PC$3.00/MF$1.45
Iowa Univ., Iowa City. Dept. of Geology.
EXPERIMENT TO EVALUATE FEASIBILITY OF UTILIZING SKYLAB-EREP REMOTE SENSING DATA FOR TECTONIC ANALYSIS OF THE BIGHORN MOUNTAINS REGION, WYOMING-MONTANA.
Quarterly progress rept., 1 Jul-30 Sep 73,
Richard A. Hoppin. 19 Oct 73, 5p NASA-CR-135739
Contract NAS9-13313

Descriptors: Bighorn Mountains(MT-WY), Multispectral photography, Tectonics, Black Hills(DS-WY), EREP, Skylab program, Photomapping, Lithology, Structural properties(Geology).

The author has identified the following significant results. Excellent imagery has been obtained from SL-3 along track five across the Bighorn Mountains and track 19 across the northern Black Hills. The red band is by far the best of the four black and white films of S-190A. Excellent detail is visible of topography, structure, resistant lithologies, and culture with good resolution obtainable at high magnification (30X). The infrared bands do not have as good resolution and are grainy at high magnification. They are of use as a complement to the red band particularly for relief enhancement in areas of heavy green grass and forest cover. S-190B high definition black and white is comparable to the red band (S-190A) in detail. Its main advantage is larger intitial scale and slightly better resolution. High resolution color transparencies along track 19 allow detailed delineation of cultivated land and strip mining. A group of folds northwest of Billings stand out clearly. Light colored units in northwestern Black Hills and in the badlands can be mapped in great detail.

NIM-1514/GA PC$3.00/MF$1.45
National Inst. For Metallurgy, Johannesburg (South Africa).
DETERMINATION BY X-RAY-FLUORESCENCE SPECTROMETRY OF MINOR AMOUNTS OF NIOBIUM AND TANTALUM IN GEOLOGICAL MATERIALS.
G. Domel, and B. G. Russell. 18 Apr 73, 13p
U.S. Sales Only.

Descriptors: (*Niobium, *X-ray fluorescence analysis), (*Tantalum, X-ray fluorescence analysis), (*Pegmatites, *Chemical analysis), Interfering elements, Melting, Niobium oxides, Quantitative chemical analysis, Tantalum oxides.

For abstract, see NSA 28 07, number 15233.

N73-30334/9GA PC$3.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
SOME PROBLEMS OF EARTHQUAKES AND THEIR PREVENTION, A. A DISCUSSION OF THE PROBLEMS OF VOLCANIC ACTIVITY, B..
M. S. Istvan. Dec 72, 11p NASA-TT-F-15095
Contract NASW-2037
Tran-Transl. Into English of "A/ Quelques Problemes des Tremblements de la Terre, de la Prevention Contre Ceux-Ci. B/ Une Discussion sur les Problemes de l'Activite Volcanique", Unpublished Report, Kosice, Czechoslovakia, 4 Apr. 1970 10 p.

Descriptors: *Crude oil, *Earthquakes, *Electromagnetic fields, *Volcanology, Cyclotrons, Earth crust, Static electricity.

For abstract, see STAR 1121

N73-30813/2GA PC$4.50/MF$1.45
Paris Univ., Orsay (France).
DETERMINATION OF VERY SMALL QUANTITIES OF RARE EARTHS IN TERRESTRIAL ROCK SAMPLES (BCR1) AND LUNAR ROCK SAMPLES (APOLLO 14) USING MASS SPECTROMETRY.
G. Puil. 1972, 46p FRNC-TH-335
Language in French.

Descriptors: *Basalt, *Lunar rocks, *Mass spectroscopy, *Rare earth elements, Apollo 14 flight, Trace contaminants.

For abstract, see STAR 1121

N73-31364/5GA PC$9.75/MF$1.45
California Univ., Berkeley. Space Sciences Lab.
ELECTRICAL PROPERTIES OF DRY ROCKS.
Final Report.
H. Morrison. Jun 73, 155p NASA-CR-133886,
SSL-SER-14-ISSUE-34
Contract NGR-05-003-447

Descriptors: *Electrical properties, *Rocks, Atmospheric moisture, Electrical resistivity, Lunar rocks, Permafrost, Permittivity.

For abstract, see STAR 1122

N73-31366/0GA PC$3.00/MF$1.45
California Univ., Santa Barbara.
BIOGEOCHEMISTRY AND BIOGEOLOGY RESEARCH PROJECTS.
Annual Progress Report, 1 Aug. 1972 - 31 Jul. 1973.
P. Cloud. 31 Jul 73, 8p NASA-CR-135650
Contract NGR-05-010-035

Descriptors: *Biochemistry, *Biology, *Research projects, Benzene, Fossils, Hexenes, Pyrolysis, Sediments.

For abstract, see STAR 1122

N73-31370/2GA PC$12.75/MF$1.45
Technische Universitaet, Clausthal-Zellerfeld (West Germany). Inst. fuer Geologie und Palaeontologie.
REMOTE SENSING AS APPLIED TO GEOLOGY. POSSIBILITIES AND PROBLEMS OF GEOLOGICAL REMOTE SENSING FROM AIRCRAFT AND SATELLITE REMOTE SENSING IN DER GEOLOGIE. MOEGLICHKEITEN UND PROBLEME DER ERDERKUNDUNG MIT HILFE VON FLUGZEUGEN UND SATELLITEN.
R. Guenther. Sep 72, 214p BMBW-FB-W-72-28
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
In German; English Summary.

Descriptors: *Earth resources survey aircraft, *Earth resources technology satellites, *Geology, *Imaging techniques, *Remote sensors, Data processing, Earth resources, Multispectral band scanners, Side-looking radar, Spectrophotometry.

For abstract, see STAR 1122

PB-224 528/0GA Not available NTIS
Oregon State Univ., Corvallis. School of Oceanography.
THOLEIITIC BASALT RIDGE IN THE PERU TRENCH,
L. D. Kulm, K. F. Scheidegger, R. A. Prince, J. Dymond, and T. C. Moore, Jr. 3 Jul 73, 6p
NSF/IDOE-73-44
Grant NSF-GX-28675
Prepared in cooperation with Hawaiian Inst. of Geophysics, Honolulu.
Pub. in Geology Volume 1, Number 1, p11-14, Sep 73.

Descriptors: (*Submarine trenches, *Pacific Ocean), (*Ocean ridges, Pacific Ocean), South America, Ocean botton, Submarine topography, Volcanism, Basalt, Sediments, Structural geology, Petrology, Continental drift.
Identifiers: *Peru Trench, Plate tectonics.

A prominent ridge occurs in the axis of the Peru Trench. It rises as much as 900 m above the trubidite fill in the trench axis and consists of relatively fresh tholeiitic basalt which is overlain by Pleistocene trench turbidites. The tholeiitic basalt was derived from oceanic layer 2 which has been faulted and uplifted relative to the trench floor as the Nazca lithospheric plate descended into the Peru Trench. A K-Ar date of 8.7 m.y. was obtained on the basalt. This date allows three possible interpretations: (1) that the oceanic crust along the eastern edge of the Nazca plate is younger than indicated by magnetic anomalies; (2) that midplate volcanism has occurred on the older oceanic crust of the Nazca plate; or (3) that the basalt is more weathered and hence older than our data suggest. The second interpretation is preferred within the framework of the existing data. (Modified author abstract)

PB-224 754/2GA PC$4.75/MF$1.45
Illinois Univ., Urbana. Dept. of Civil Engineering.
INTRODUCTION TO BASIC REMOTE SENSING FOR ENGINEERING GEOLOGISTS.
Final rept.,
Peter J. Tarkoy. Jun 71, 173p* UILU-CE-495

Descriptors: (*Engineering geology, *Remote sensing), Detectors, Spectrum analyzers, Infrared detectors, Ultraviolet detectors, Photographic equipment, Gamma spectrometers, X ray spectrometers, Microwave spectrometers, Instrument characteristics.
Identifiers: Multiband spectral reconnaissance.

The objective of the report is to present a technical discussion of the theory of the electromagnetic spectrum and relevance to remote sensors, describe the bands and sensors used in application, and relate how they can be useful in engineering geology and geological exploration. A discussion of each sensor's capabilities, most useful application, and examples of past experiences are also included.

RLO-2225-T-24-9/GA PC$3.00/MF$1.45
Washington Univ., Seattle. Dept. Of Oceanography.
PLANKTONIC FORAMINIFERAN: RADIOLARIAN STRATIGRAPHY AND THE PLEISTOCENE--HOLOCENE BOUNDARY IN THE NORTHEAST PACIFIC.
W. D. Barnard, and D. A. McManus. 1972, 10p

Descriptors: (*Pacific ocean, *Plankton), Age estimation, Boreholes, Geology, Sampling, Sediments, Stratigraphy.

For abstract, see NSA 28 07, number 17797.

8H. Hydrology and Limnology

AD-768 507/6GA Reprint
California Univ Los Angeles Dept of Chemistry
TRITIUM HYDROLOGY STUDIES IN CALIFORNIA,
W. F. Libby, and J. S. Leventhal. 1971, 16p
AFOSR-TR-73-1789
Grant AF-AFOSR-2019-71
Availability: Pub. in Tritium, p724-736 1971.

Descriptors: (*Tritium, *Tracer studies), (*California, *Hydrology), Radioactive fallout.
Identifiers: Hydrogeology, Ground water.

Brief summaries of research studies conducted in California on tritium tracing of the hydrologic cycle are presented. The increase in tritium levels due to thermonuclear weapons testing is discussed. References to published results of these studies are included.

ARMS-73.6.1/GA PC$4.00/MF$1.45
Eg and G, Inc., Las Vegas, Nev.
AERIAL RADIOLOGICAL MEASURING SURVEY OF THE AREA SURROUNDING THE SHIPPINGPORT ATOMIC POWER STATION, SHIPPINGPORT, PENNSYLVANIA, FEBRUARY 1973.
Jul 73, 15p

Descriptors: (*Shippingport reactor, *Radiation monitoring), (*Natural radioactivity, *Aerial monitoring), Environment, Gamma sources, Surface air, Surface contamination.

For abstract, see NSA 28 07, number 15480.

COM-73-11637/8GA PC$18.25/MF$1.45
National Ocean Survey, Detroit, Mich. Lake Survey Center.
GREAT LAKES RESEARCH PROJECT FORECASTS DIRECTORY - 1973.
Technical memo.,
Louis X. Barbalas. Apr 73, 324p NOAA-TM-NOS-LSC-D-5 NOAA-73091002

Descriptors: (*Great Lakes, *Research projects), Directories, Air water interactions, Water quality, Limnology, Aquatic biology, Water pollution, Hydrology, Geology.
Identifiers: Scientific research, Sediment water interactions.

The directory describes over 270 proposed, continuing, and completed Great Lakes water-related research and development projects, technical reports, theses, and data surveys during 1973. It was compiled from volunteered information. Seven indexes are provided, as follows: (1) Organizational; (2) Geographical; (3) Subject field; (4) Procedures and services; (5) Mode of investigation; (6) Platforms and equipment; and (7) Principal investigators. (Author)

COM-73-11686/5GA PC$3.50/MF$1.45
Wisconsin Univ., Madison. Sea Grant Program.
OUR GREAT LAKES,
Linda Weimer, Warren Downs, James Napoli, Patricia Mallonee, and Peyton Smith. Sep 73, 51p
WIS-SG-73-114 NOAA-73100205

Descriptors: (*Great Lakes, Resources), Fisheries, Recreation, Management, Cargo transportation, Water pollution, Beach erosion, Water quality.
Identifiers: Sea Grant program.

The discussions focus on Lakes Michigan and Superior but they deal with all the Great Lakes and man's interactions with them. With man's use of the lakes has come abuses. Commercial fishing has probably suffered the most. Overfishing of stocks, the building of canals to enhance shipping, and the pollution of lake water from coastal industries have been the most destructive influences. The recreation explosion has been both a boon and a bane. As the number of problems in the Great Lakes has increased, so has the number of people and organizations geared to solve them. Information is given on the various organizations concerned with problems of management of the resources of the Great Lakes. A bibliography of pertinent literature is included.

COM-73-11796/2GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
EUTROPHICATION. A SELECTED BIBLIOGRAPHY.
Rept. for 1964-Aug 73,
Axel C. Ringe. Nov 73, 96p NTIS-WIN-73-073
Supersedes NTIS-PK-118.

Descriptors: (*Limnology, *Bibliographies), (*Water pollution, Limnology), Primary biological productivity, Ecology, Nutrients, Mathematical models, Lakes, Streams, Fresh water biology, Algae, Plankton.
Identifiers: *Eutrophication.

The NTISearch bibliography contains 91 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. Cited reports include research on primary productivity, the influence and impact of nutrients on lakes and streams, and mathematical modeling of eutrophication processes. (Author)

COM-73-11799/6GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
STUDIES OF SALINE SOILS AND GROUND WATER. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Oct 73,
Edward J. Lehmann. Nov 73, 60p* NTIS-WIN-73-076
Supersedes NTIS-PK-57.

Descriptors: (*Salinity, *Ground water), (*Irrigation, Salinity), (*Bibliographies, Ground water), (*Salt water intrusion, Bibliographies), Hydrology, Water quality, Soil water, Ground water recharge, Aquifers, Water supplies, Arid land, Water pollution.

The NTISearch bibliography contains 55 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The abstracts cover the following topics on saline soils and ground water: Irrigation return flow, hydrology, aquifers, water pollution, salt water intrusion, and effects upon water supplies. (Author)

COM-73-11857/2GA PC$8.00/MF$1.45
Aerojet Electrosystems Co., Azusa, Calif.
AIRBORNE PASSIVE MICROWAVE MEASUREMENTS OF NOAA HYDROLOGY SITES.
Final rept.,
G. Poe, D. Meeks, and A. T. Edgerton. Jun 73, 117p AESC-1752-FR-1 NOAA-73100104
Contract NOAA-2-37116

Descriptors: (*Remote sensing, *Soil water), Aerial photography, Microwave frequencies, Measuring instruments, Data processing, Passive detection, Surface temperature, Minnesota, New York.
Identifiers: Luverne(Minnesota), Scipio-Fleming(New York), Boonville(New York), Oneida(New York).

A series of airborne passive microwave measurements were conducted at 13.4 and 4.99 GHz (with vertical and horizontal polarizations) at a 37 degrees view angle over four NOAA hydrology sites near: Luverne, Minnesota; Scipio-Fleming, New York; Boonville, New York; and Oneida, New York. Infrared and 35 mm aerial photography data were collected along each flight line. The aircraft (ground) speed and altitude (130 mph and 500 and 2500 feet respectively) were selected to optimize the acquisition of passive microwave data, not heretofore available, of large grassland areas containing substantial amounts of surface vegetation. Excellent correlation of the 13.4 and 4.99 GHz data was obtained over most of the flight lines. The correlation between the vertical and horizontal polarization was equally as good. Statistically meaningful correlations between the airborne microwave data and available ground-based soil moisture measurements were not obtained in the present study. The lack of correlation is believed to be due to (1) probable non-specular scattering and attenuating associated with surface vegetation and (2) lack of sufficiently detailed ground-based measurements. (Modified author abstract)

E73-11085/GA PC$3.00/MF$1.45
Alaska Univ., College. Inst. of Water Resources.
BREAK-UP CHARACTERISTICS OF CHENA RIVER BASIN.
Bimonthly progress rept. no. 7,
Robert F. Carlson. 31 Sep 73, 5p NASA-CR-135553
Contract NAS5-21833

Descriptors: Mathematical models, Snow cover, Melting, Chena River Basin(AK), Earth resources program, Water resources, Hydrology.

The author has identified the following significant results. Results from snowmelt model were obtained showing the decreasing changes in snow depth for four elevational ranges in the Chena River Basin. This model is based on the energy balance of the snowpack and the results are shown on attached figures. Also, the measured hydrographs for two stations on the Chena River are shown. The next phase of the study will be to analyze the model using both ERTS-1 imagery and measured field values.

E73-11102/GA PC$3.00/MF$1.45
Texas Tech Univ., Lubbock. Remote Sensing Lab.
DYNAMICS OF PLAYA LAKES IN THE TEXAS HIGH PLAINS.
Progress rept. Apr-Sep 73,
C. C. Reeves, Jr. 30 Sep 73, 10p NASA-CR-135571
Contract NAS5-21720

Descriptors: Spectral signatures, Ecosystems, Geology, Water resources, Texas, Playas, Earth resources program, Lakes, Multispectral band scanners.

The author has identified the following significant results. This project is designed to correlate ERTS-1 satellite imagery signatures with the water balance ecosystem and geology of select playa lake basins in West Texas. The principal work consisted of monitoring the weather instruments, the measurement of water levels and water depths, examination of MSS imagery, and measurement of water and mud areas by use of ESIAC (Electronic Satellite Image Analysis Console) at Stanford Research Center, Menlo Park, California. A cost/benefit analysis, comparing the use of ERTS-1 data to more conventionally secured data, revealed that use of ERTS-1 data for such a survey reduces cost from $2.00 to $0.03/square mile.

E73-11161/GA PC$3.00/MF$1.45
Geological Survey, Washington, D.C.
UTILIZATION OF REMOTELY-SENSED DATA IN THE MANAGEMENT OF INLAND WETLANDS,
Virginia Carter, and Doyle G. Smith. 1973, 10p
NASA-CR-135755
Contracts NAS5-21752, NASA-Order S-70243-AG
Prepared in cooperation with American Univ., Washington, D.C.
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S. D. 57198. ERTS.

Descriptors: Wetlands, Virginia, North Carolina, Florida, Land management, Earth resources program, Water management, Ecology, Water resources.

The author has identified the following significant results. ERTS-1 data and aerial photography are proving to be a useful tool for the inventory and management of inland wetlands. Two examples of the application of remotely-sensed data to specific wetland management needs or requirements are discussed. Studies of the Great Dismal Swamp are using ERTS-1 imagery and color IR photography in: (1) study area selection; (2) field inspection; (3) vegetation mapping; (4) identification of drainage characteristics and moisture regime; (5) location of intensive study areas; and (6) detection of change. Thematic extractions of ERTS-1 data made using the United States Geological Survey's Autographic Theme Extraction System are aiding analyses of swamp hydrologic regime and providing information pertinent to quick recognition and inventory of wetlands from ERTS-1. DCP's in south Florida wetlands provide near-real time data for water resources managers. Data relayed by satellite can be entered into models to provide predictive data and water storage information for long-term and short-term decision making.

PB-224 433/3GA PC$4.25/MF$1.45
Georgia Inst. of Tech., Atlanta. Environmental Resources Center.
GEORGIA'S WATER PROBLEMS AND RELATED RESEARCH NEEDS.
Completion rept. 19 Oct 71-31 Aug 73,
Gene E. Willeke, Arthur C. Benke, Alan M. Lumb, Billy H. Kornegay, and Walter P. Neely. Aug 73, 113p ERC-1173 W74-00004, OWRR-A-041-GA(1)
Contract DI-14-31-0001-3810

Descriptors: (*Water resources, *Georgia), (*Project planning, Georgia), Research projects, Water quality, Water supply, Ecology, Limnology, Irrigation, Water pollution, Management planning.

Water problems and research needs are discussed by region of the State. They are also discussed under the headings of water quantity, quality, ecology, planning and management, and agriculture. A survey of research capability in Georgia colleges is included. Technology transfer needs are addressed and related to research. Though a water-rich State, Georgia has a wide range of water problems, including floods, droughts, pollution, local water shortages, soil erosion, and conflicts over the use of land and water resources. The problems are shifting from predominantly rural to predominantly urban.

PB-224 434/1GA PC$3.75/MF$1.45
Mississippi State Univ., State College. Water Resources Research Inst.
INTERACTION OF BULK PRECIPITATION, STREAM WATER, AND SEWAGE IN A SMALL WATERSHED NEAR OXFORD, MISSISSIPPI,
Konrad J. Banaszak, Charlie B. Whitten, and Dan A. Thompson. Aug 73, 76p W73-00005, OWRR-A-063-Miss(1)

Descriptors: (*Watersheds, *Water analysis), Mississippi, Precipitation(Meteorology), Stream flow, Sewage, Surface water runoff, Hydrology, Trace elements, Silicon dioxide, Calcium, Magnesium, Sodium, Potassium, Zinc, Sulfates.
Identifiers: Oxford(Mississippi).

A 500 hectare (54% forest, 26% pasture and fallow field, and 20% rural urban) rainfed watershed near Oxford, Mississippi was studied from July 1, 1972 to June 30, 1973. During this period, 200 centimeters (132 cm are 'normal') of precipitation with an average pH of 4.6 and an average composition in parts per million of 0.66 calcium, 0.04 magnesium, 0.54 sodium and 0.23 potassium fell. The stream discharge of 80 centimeters had a neutral pH and an average composition in parts per million of 6.4 calcium, 1.5 magnesium, 6.4 sodium, 2.2 potassium, 13 bicarbonate, 12 sulfate, and 5.5 chloride. A sewage influx of 50 liters per second had little noticeable effect on the composition of storm runoff. The reasons for the change from bulk precipitation to stream water are not clear but must involve biologic, aerosol, and anthropogenic material. The change is compatible with a change from a water in equibibrium with gibbsite to a water in equilibrium with gibbsite and kaolinite. (Modified author abstract)

PB-224 438/2GA PC$9.75/MF$1.45
Geological Survey of Alabama, University.
THE ALABAMA WATER-RESOURCES SPECTRUM.
Final rept.,
Henry C. Barksdale, L. B. Peirce, and Herbert S. Chaffin, Jr. Feb 73, 155p ALA-GSA-X996-WRC-72-9

Descriptors: (*Alabama, *Water resources), Surface waters, Ground water, Flood plains, Utilization, Water consumption, Management planning.

The report is essentially the physical basis for the planning, management, and development of the water and related land resources of the state. It deals with the waters of the state, their origins, movements, and destinations; and with the related lands. It attempts to describe, to interpret, and to summarize with a view to providing an understanding of the nature of the resource and the needs for its management and conservation. The estimated dependable yield of Alabama's streams is in the order of 55 billion gallons per day and that of the State's ground-water resources is 5 to 6 billion gallons per day. More than four-fifths of the available water has been committed to some use. The remainder constitutes a prime resource for future growth and development. Upon the manner of its use depends in large measure the quality of the future environment for economic growth and human existence in the State. (Modified author abstract)

PB-224 439/0GA PC$4.00/MF$1.45
Geological Survey of Alabama, University.
A PLAN FOR THE IMPROVEMENT OF THE LOW-FLOW DATA NETWORK IN ALABAMA.
Interim rept.,
Eugene C. Hayes. May 73, 36p ALA-GSA-X996-WRC-73-10
Prepared in cooperation with Geological Survey, Washington, D.C. Sponsored in part by Alabama Development Office, Mongomery.

Descriptors: (*Stream flow, Data acquisition), (*Alabama, *Water supply), Evolution(Development), Flow measurement, Networks, Planning.

As population and industry grow in Alabama, the low flow of streams is increasingly becoming a critical factor in problems of water-resources development and management, particularly those relating to water supply and water-quality control. The existing network of gaging stations for supplying low-flow data has evolved over a period of nearly 80 years from somewhat limited and fragmented planning efforts. It is now clear that modernization of the network is necessary if it is to meet the current and projected needs for low-flow information in the State. This report describes a systematic work plan for improving the low-flow data network. Major objectives of the plan are (1) development of a technique for estimating the low-flow characteristics of ungaged streams, and (2) a comprehensive analysis and compilation of low-flow data for streams in Alabama.

PB-224 491/1GA PC-GPO/MF$1.45-NTIS
Florida Univ., Gainesville. Dept. of Environmental Engineering.
NITROGEN SOURCES AND CYCLING IN NATURAL WATERS.
Ecological research series,
Patrick L. Brezonik. Jul 73, 169p W73-00149, EPA-660/3-73-002
Paper copy available from GPO $2.35 as stock no. EP1.23:660-73-002.

Descriptors: (*Nitrogen cycle, *Lakes), Florida, Biochemical cycles, Rainfall, Limnology, Sediments, Nitrogen fixation, Bioassay, Ammonia, Water quality, Stratification, Algae, Bacteria, Nutrients.
Identifiers: *Eutrophication, Sediment water interactions.

Sources of nitrogen were reviewed to determine their significance in lake nitrogen budgets. Nutrients in rainfall were evaluated and found to be significant. Nitrogen and phosphorus budgets were calculated for 55 Florida lakes and critical loading rates established by comparing calculated budgets with data on trophic state. Nitrogen fixation by Cyanophyceae was studied in detail in two eutrophic Florida lakes for one year. Also a survey of fixation in Florida lakes was conducted and fixation found only in eutrophic lakes. Bacterial fixation was found to contribute significant nitrogen to the anoxic hypolimnon of a small stratified lake. Nitrogen fixation was found in both lacustrine and estuarine sediments. Sediments of 55 lakes were characterized chemically and results suggest that such sediment may act as an ammonia buffer, sorbing ammonia at high concentrations and releasing it to ammonia depleted water. Estuarine sediment sorbed ammonia strongly but failed to release it to overlying water. The acetylene reduction assay for nitrogen fixation was evaluated. Interferences in automated nutrient determinations due to organic color were studied and simple color correction found for nitrite, nitrate and orthophosphate but not ammonia as determined by the indophenol method. Amino acids also interfered with the ammonia analysis. (Modified author abstract)

PB-224 492/9GA PC-GPO/MF$1.45-NTIS
North Dakota Univ., Grand Forks. Dept. of Biology.
WEED HARVEST AND LAKE NUTRIENT DYNAMICS,
Joe K. Neel, Spencer A. Peterson, and Wintfred L. Smith. Jul 73, 101p W74-00150, EPA-660/3-73-001
Paper copy available from GPO $1.25 as EP1.23:669-73-001 and EPA-660-3-73-001.

Descriptors: (*Aquatic weeds, Water pollution), (*Water pollution, *Lake Sallie), (*Limnology, Minnesota), Effluents, Phytoplankton, Algae, Primary biological productivity, Nitrogen inorganic compounds, Decomposition, Photosynthesis, Fresh water fishes, Harvesting, Sampling, Water chemistry, Biochemical oxygen demand, Cost estimates, Phosphorus, Nutrients.
Identifiers: Eutrophication.

After more than 60 years of cultural eutrophication Lake Sallie supports dense growths of phytoplankton and rooted vegetation. Its major water mass has the chemical character imparted by photosynthesis at all seasons, and chemical effects of decomposition are rather localized. Phytoplankton dominance alternates among diatoms, blue-green, and green algae, in that order of abundance. Prior to operation of a weed harvester, attached plants grew densely over 34% of the bottom area. The bulk of nitrogen and phosphorus is usually contained in the water mass, with noticeably smaller amounts in upper bottom sediments and biota. The fish population, less than one half the mass of weeds, contained considerable more N and P than weeds in 1971. Harvest in 1970 evidently reduced weed density in 1971, and increased the cost per unit of nutrients removed. Nitrogen and phosphorus removed in weeds were insignificant when compared with annual wastewater effluent contributions to the lake. (Modified author abstract)

PB-224 563/7GA PC$4.50/MF$1.45
Geological Survey, Helena, Mont.
APPRAISAL OF THE QUALITY OF GROUND WATER IN THE HELENA VALLEY, MONTANA.
Water resources investigations (Final),
K. R. Wilke, and D. L. Coffin. Sep 73, 50p
USGS/WRI-32-73, USGS/WRD-73-020
Prepared in cooperation with Lewis and Clark County Commissioners and Lewis and Clark County Planning Board, Helena, Mont.

Descriptors: (*Helena Valley, *Ground water), (*Water quality, Helena Valley), Water analysis, Inorganic nitrates, Coliform bacteria, Distribution(Property), Trace elements, Montana.
Identifiers: Helena(Montana).

Analyses of ground-water samples from the Helena valley in west-central Montana show that nitrate (as nitrogen) concentrations ranged from less than 0.1 to 6.3 mg/l (milligrams per liter) and that the median value was 0.9 mg/l. Chloride concentrations ranged from 1.4 to 120 mg/l, and the median value was 8.4 mg/l. The areal distribution of nitrate indicates that the sources of nitrate are in the valley, and that areas of high nitrate concentrations coincide with areas of dense population. Results of bacteriological analyses of 65 samples of ground water indicate that coliform bacteria were absent. Ten water samples analyzed for trace element content had a few moderately high concentrations of arsenic, copper, lead, and zinc. With few exceptions, ground water in the Helena valley is of good quality and mostly a calcium bicarbonate type. Despite locally high dissolved-solids content, the water is suitable for drinking, according to U.S. Public Health Service standards. (Author)

RLO-2225-T-24-5/GA PC$3.00/MF$1.45
Washington Univ., Seattle. Dept. Of Oceanography.
SORPTION-DESORPTION REACTIONS OF MERCURY WITH SUSPENDED MATTER IN THE COLUMBIA RIVER.
M. F. Bothner, and R. Carpenter. 1972, 15p SM-15815

Descriptors: (*Mercury, *Adsorption), (*Columbia river, *Water pollution), Chemical reactions, Desorption, Particles, Quantitative chemical analysis, Seawater, Sediments, Silt, Surface waters, Tracer techniques.

For abstract, see NSA 28 07, number 15507.

USGS-474-171/GA PC$5.45/MF$1.45
Geological Survey, Lakewood, Colo. (Usa).
WATER LEVELS AND SPRING DISCHARGES FOR SELECTED WELLS AND SPRINGS IN NEVADA, 1966--69.
D. D. Gonzalez, C. T. Warren, and C. L. Washington. Jul 73, 69p
Contract AT(29-2)-474

Descriptors: (*Nevada, *Hydrology), Data, Ground water, Site selection, Surface waters, Tables.

For abstract, see NSA 28 07, number 15495.

8I. Mining Engineering

AD-768 719/7GA PC$7.25/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
GYROCOMPASSES IN MINE SURVEYING,
Dmitrii Nikolaevich Oglobin, and Vadim Konstantinovich Muzykantov. 14 Aug 73, 103p
Rept no. FSTC-HT-23-0920-73
Trans. of unidentified Russian article, Kiev, 1970 95p.

Descriptors: (*Surveying, Instrumentation), Gyro compasses, Theodolites, Design, Instruction manuals, USSR.
Identifiers: Translations, *Mine surveys, *Surveying instruments.

This is a handbook to introduce mine surveyors to the use of gyrocompass (gyrotheodolite) equipment. It contains a brief explanation of the principle of the gyroscope and of a pendulum type, meridian-tracking gyrocompass. Typical Soviet, Hungarian and East German mine surveying gyrocompasses are described in some detail, with instructions and examples of their use. There are brief discussions of the relative advantages and disadvantages of the various instruments. This handbook, together with the manufacturer's instructions, should be adequate to enable a mine surveyor with no previous experience of these instruments to use them in orienting underground surveys.

AD-768 742/9GA PC$4.50/MF$1.45
Naval Weapons Lab Dahlgren Va
THE DEVELOPMENT OF A SYSTEM TO SUPPRESS AND EXTINGUISH FULLY DEVELOPED COAL DUST EXPLOSIONS: PROGRESS REPORT.
Technical rept.,
L. D. Johnson, J. A. Canfield, D. B. Lull, and T. F. Morris. Sep 73, 140p Rept no. NWL-TR-3030

Descriptors: (*Dust explosions, Control), (*Coal, Dust explosions), Design, Methane, Ignition, Fire extinguishers, Flame propagation, Potassium compounds, Carbonates, Pressure.
Identifiers: *Coal dust, Coal mines, Systems analysis, Mine safety, Potassium carbonates.

A program for the Bureau of Mines to develop a system to suppress coal mine dust explosives has achieved certain notable results at the end of the first year. After extensive study of coal dust explosion phenomena a project plan was developed, a test facility built and several suppression devices tested. The facility is a 4.5 foot diameter shock tube, 317 feet in length, and to date 53 tests have been carried out with methane-air and methane/coal dust-air as the explosive mixtures. Suppression of slowly propagating (up to 300 ft/sec) flame fronts has been successfully carried out on two tests using the dry chemical extinguishing agent Purple K. Delivery of the material directly into the flame front seems to be required if effective suppression is to be accomplished. (Author)

COM-73-11691/5GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
OIL SHALE. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-May 73,
Axel C. Ringe. Aug 73, 65p* NTIS-WIN-73-050
Supersedes NTIS-PK-107.

Descriptors: (*Oil shale, *Bibliographies), Fossil fuel deposits, Geophysical prospecting, Beneficiation, Geology, Mineral economics, Environmental surveys, Fuels, Oil recovery, Mining, Hydrocarbons.
Identifiers: Nahcolite, Dawsonite.

NTISearch bibliography contains 60 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The reports selected cover all phases of oil shale research, including exploration, mining, retorting, chemistry, environmental impacts, and policies. (Author)

COM-73-11738/4GA PC$2.75/MF$1.45
Hawaii Univ., Honolulu.
DEVELOPMENT OF A SUBMARINE SAND RECOVERY SYSTEM FOR HAWAII.
Advisory rept.,
Frederick M. Casciano. Jul 73, 19p UNIHI-SEAGRANT-AR-73-04 NOAA-73090509
Contract NOAA-2-35243, Grant NOAA-043-158-29

Descriptors: (*Ocean bottom, *Hydraulic mining), (*Sands, *Mining), Hawaii, Dredging, Design, Model tests, Beach nourishment.
Identifiers: Sea Grant program.

A unique system for mining ocean bottom sand from a small vessel was conceived and developed under the University of Hawaii's Sea Grant Program. Called the Submarine Sand Recovery System, or SSRS, it consists primarily of a suction probe which buries itself in thick deposits of sand by hydro-jet action and removes large cones of sand which can be transferred to shore for beach replenishment. The probe is handled on the bottom by divers with the aid of a special underwater lifting drum. The head is fitted with a hydraulically powered roller-crusher to grind up coral, rock, and shell fragments at the sand inlet. It is expected that under certain conditions the system will provide a more economical and ecologically sound means of recovering offshore sand than is offered by conventional dredging systems. Laboratory and ocean tests were conducted on a series of models. A prototype (6-inch diameter pipe) was constructed and underwent preliminary testing in November of 1972. (Author)

COM-73-11783/0GA PC$4.50/MF$1.45
Utah Univ., Salt Lake City. Dept. of Geological and Geophysical Sciences.
SOURCE MECHANISMS OF MICROEARTHQUAKES ASSOCIATED WITH UNDERGROUND MINES IN EASTERN UTAH.
Final rept., 1 May 70-30 Jun 72,
Robert B. Smith, Patrick L. Winkler, John G. Anderson, and Christopher H. Scholz. 30 Jun 72, 46p NOAA-73092516
Contract NOAA-E22-121-70(G), Grant NSF-GA-11150
Prepared in cooperation with Lamont-Doherty Geological Observatory, Palisades, N.Y.

Descriptors: (*Earthquakes, *Mining), (*Microseisms, Mining), Geological faults, Tectonics, Coal, Sesimic waves, Spectral energy distribution, Stresses, Utah.

A detailed microearthquake survey, with acoustic monitoring, was conducted in the Sunnyside coal district of eastern Utah to investigate the possible relationship between earthquakes and mining. Rates of earthquake activity averaged hundreds of events per day with magnitudes from minus 0.5 to plus 2.0. The main earthquake energy may be derived from regional tectonic stress. Acoustic emissions recorded within the mine showed an average rate of 180 per hour and appear to be due to shear failures near the mine walls. The rate of acoustic activity decreased with time after the latest mining activity. Spectral analyses of direct shear waves from the sub-mine quakes yielded estimates of source parameters at hypocentral distances from 1.3 km to 3.0 km. The data are in agreement with the results of other work and extend the previous studies of source spectra down to magnitudes less than plus one for short hypocentral distances. (Modified author abstract)

E73-11148/GA PC$3.00/MF$1.45
Geological Survey, Bloomington, Ind. Coal Section.
APPLICATION OF EREP IMAGERY TO FRACTURE-RELATED MINE SAFETY HAZARDS AND ENVIRONMENTAL PROBLEMS IN MINING.
Quarterly progress rept. 20 Jul-20 Oct 73,
Charles E. Wier, Frank J. Wobber, Roger V. Amato, and Orville R. Russell. 22 Oct 73, 8p
NASA-CR-135736
Contract NAS9-33358
Prepared in cooperation with Earth Satellite Corp., Washington, D. C.

Descriptors: Mines(Excavations), Safety, Coal, Hazards, Geological faults, Indiana, EREP, Skylab program, Multispectral photography, Fracturing.

The author has identified the following significant results. Numerous fracture traces were detected on both the color transparencies and black and white spectral bands. Fracture traces of value to mining hazards analysis were noted on the EREP imagery which could not be detected on either the ERTS-1 or high altitude aircraft color infrared photography. Several areas of mine subsidence occurring in the Busseron Creek area near Sullivan, Indiana were successfully identified using color photography. Skylab photography affords an increase over comparable scale ERTS-1 imagery in level of information obtained in mined lands inventory and reclamation analysis. A review of EREP color photography permitted the identification of a substantial number of non-fuel mines within the Southern Indiana test area. A new mine was detected on the EREP photography without prior data. EREP has definite value for estimating areal changes in active mines and for detecting new non-fuel mines. Gob piles and slurry ponds of several acres could be detected on the S-190 B color photography when observed in association with large scale mining operations. Apparent degradation of water quality resulting from acid mine drainage and/or siltation was noted in several ponds or small lakes and appear to be related to intensive mining activity near Sullivan, Indiana.

INP-817/GA PC$5.25/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
APPLICATION POSSIBILITIES OF RADIOACTIVE TRACERS IN THE PARAMETERS IDENTIFICATION OF PARTICULAR OBJECTS OF A COPPER ORE PREPARATION PLANT.
K. Korbel, A. Michalik, P. Nizegorodcew, and J. Plechta. 1972, 62p
In Polish. U.S. Sales Only.

Descriptors: (*Tracer techniques, *Radioactivation), (*Copper ores, *Ore processing), Activation analysis, Labelling, Mathematical models.

For abstract, see NSA 28 08, number 20616.

LA-5208-MS/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
PHENOMENA ASSOCIATED WITH THE PROCESS OF ROCK MELTING. APPLICATION TO THE SUBTERRENE SYSTEM.
M. C. Krupka. Feb 73, 10p
Contract W-7405-eng-36

Descriptors: (*Rocks, *Melting), (*Subterrene penetrators, *Performance), Excavation, Specific heat, Ultrahigh temperature.

For abstract, see NSA 28 08, number 18153.

PB-224 455/6GA PC-GPO/MF$1.45-NTIS
Bureau of Mines, Washington, D.C.
LIST OF BUREAU OF MINES PUBLICATIONS AND ARTICLES, JANUARY 1 TO DECEMBER 31, 1972, WITH SUBJECT AND AUTHOR INDEX.
Special pub.,
Rita D. Sylvester. Sep 73, 123p BuMines-SP-2-73
See also report dated Aug 72, PB-211 366.
Paper copy available from GPO $1.25 as stock no. 2404-01404.

Descriptors: (*Mining, Bibliographies), (*Mining engineering, Bibliographies), Abstracts, Indexes(Documentation).

The compilation lists and summarizes publications by Bureau authors published in the regular Bureau of Mines series, in scientific, technical or trade journals, or in other media; those available from the Bureau of Mines are indicated. Patents issued to Bureau personnel are also listed, and instructions are given on how to apply for permission to use them. One of the outstanding features of this special publication is an exhaustive subject and author index.

PB-224 570/2GA PC$3.00/MF$1.45
Bureau of Mines, Washington, D.C.
DEGASIFICATION OF VIRGIN PITTSBURG COALBED THROUGH A LARGE BOREHOLE.
Rept. of investigations,
Herbert H. Fields, Stephen Krickovic, Albert Sainato, and M. G. Zabetakis. Sep 73, 32p* BuMines-RI-7800
Prepared incooperation with Pittsburg Mining and Safety Research Center, Pa.

Descriptors: (*Coal deposits, *Degasification), Boreholes, Shaft sinking, Flammable gases, Safety, Mining engineering, West Virginia.

The Bureau of Mines is in the process of degasifying a virgin area in northern West Virginia from the base of an 839-foot-deep vertical borehole. An insitu gas pressure hole 199 feet long, and seven degasification holes ranging in depth from 500 to 850 feet (average 618 feet) were drilled in an 8-foot-thick virgin Pittsburgh coalbed from the enlarges (14-foot-diameter) bottom of this borehole. The in-situ pressure at the back end of the hole and the range of gas and water flows from degasification holes as they were completed and closed off were 203 psi, 79,000 to 257,000 cfd (average 160,000 cfd), and 5 to 8 gpm per hole (average 6.8 gpm), respectively. Twenty-four hours after the seven holes were connected through individual water traps to a common collector for natural venting of the gas through pipes to the atmosphere, the total gas and water flows and the in-situ pressure dropped respectively to 971,000 cfd, 1.3 gpm, and 18 psi. Eighty days later the corresponding values dropped to 529,000 cfd, 0.50 gpm, and 13 psi. After 180 days of degasification, 91 million cubic feet of gas had been removed from the affected virgin area. This represents 60 to 70 percent of the gas calculated to be contained in the area of coal affected by the holes. (Author)

PB-224 602/3GA PC$3.50/MF$1.45
Bureau of Mines, Washington, D.C.
IN SITU RETORTING OF OIL SHALE. RESULTS OF TWO FIELD EXPERIMENTS.
Report of Investigations,
E. L. Burwell, T. E. Sterner, and H. C. Carpenter. Sep 73, 47p* BuMines -RI-7783
Prepared by Laramie Energy Research Center, Wyo.

Descriptors: (*Oil shale, *In situ combustion), Shale oil, Oil recovery, Wyoming, Yield.

Application of the in situ recovery process to oil shale was tested during two field experiments near Rock Springs, Wyo. The results of these tests demonstrated that a self-sustaining combustion zone can be created in an oil shale body, that this zone can be moved through the oil shale, and that the process will produce shale oil. Evaluation of the combustion process by monitoring produced fluids for physical and chemical properties and volumes is described. The material and energy balance obtained is compared with a second evaluation based on extensive coring of the test area after the test was terminated. Several side results of the research are noted such as ground surface heating by underground burning and production of low to medium Btu gas during retorting. (Author)

8J. Physical Oceanography

AD-768 359/2GA PC$3.00/MF$1.45
Colorado State Univ Fort Collins Dept of Electrical Engineering
ACOUSTIC SCATTERING FROM A STOCHASTIC SEA SURFACE,
Louis L. Scharf, and Robert L. Swarts. 7 Oct 73, 32p
Contracts N00014-69-C-0317, N00014-67-A-0299-0019
Sponsored in part by Contract N000123-73-C-1375.
Prepared in cooperation with Honeywell, Inc., Seattle, Wash. Marine Systems Div.

Descriptors: (*Underwater sound, Scattering), Sound transmission, Power spectra, Statistical functions, Approximation(Mathematics), Surface roughness.
Identifiers: Ocean surface, Sea states, Acoustic scattering, Covariance.

The spectral and covariance properties of surface-scattered acoustic fields are determined for slightly rough and very rough sea surfaces that are irradiated with far-field, single frequency sources. The results obtained are general in the sense that they depend only on the frequency-wavenumber spectrum of the stochastic sea surface and not on any particular surface spectrum. Exact results are obtained for sinusoidal seas and these results are compared with various approximate solutions. The approximations clearly indicate the connection between sinusoidal seas. (Author)

AD-768 375/8GA PC$2.75/MF$1.45
Scripps Institution of Oceanography La Jolla Calif
SURFACE WATER TEMPERATURES AT SHORE STATIONS, UNITED STATES WEST COAST, 1972.
Data rept.,
Margaret K. Robinson. 25 May 73, 22p Rept no. SIO-Ref-73-15
Contract N00014-69-A-0200-6006

Descriptors: (*Pacific Ocean, Surface temperatures), Salinity, Diurnal variations, Sea water, Oceanographic data, Washington(State), Oregon, California.
Identifiers: Ocean surface.

The report presents temperature and salinity data observed during 1972 at shoreline stations along the west coast of North America from the Strait of Juan de Fuca, WA., to La Jolla, CA. Various agencies and volunteers have participated in the collection of the data, representing 25 stations. (Author)

AD-768 684/3GA Reprint
Scripps Institution of Oceanography La Jolla Calif
REMOTE SENSING OF THE OCEAN,
W. H. Munk, J. D. Wood, W. P. Birkemeier, C. G. Little, and R. H. Stewart. 12 Sep 72, 11p
Contract N00014-69-A-0200-6008
Availability: Pub. in Boundary-Layer Meteorology, v5 p201-209 1973.

Descriptors: (*Oceanographic data, Measurement), Acoustic detectors, Opdar, Underwater light, Electromagnetic waves.
Identifiers: *Remote sensing.

The authors consider the problem of remote sensing of the oceans in the context of atmospheric remote sensing. The principal interest is in remotely sensing the ocean from within the ocean. (Modified author abstract)

AD-768 687/6GA PC$3.00/MF$1.45
Naval Oceanographic Office Washington D C
ANNUAL VARIATION OF THE INTENSITY OF THE LABRADOR AND WEST GREENLAND CURRENTS AND THE PREDICTION OF TEMPERATURE CONDITIONS IN COMMERCIALLY EXPLOITED REGIONS OF THE NORTHWEST ATLANTIC OCEAN,
A. A. Yelizarov. 1973, 26p Rept no. NOO-TRANS-570
Trans. by Okeanologiya (USSR) v2 n5 p796-809 1962, by V. Astvazaturov.

Descriptors: (*Ocean currents, *Temperature), Tables, Newfoundland(Province), USSR.
Identifiers: Translations, North Atlantic Ocean, Labrador current, West Greenland current.

The paper reports an investigation of the possibility of predicting temperature conditions in the Newfoundland and Labrador regions from water temperatures along the Kola meridian. Historical temperature data for the Labrador and West Greenland Currents are given and analyzed.

AD-768 740/3GA PC$3.00/MF$1.45
Naval Oceanographic Office Washington D C
WORLD WIDE DISTRIBUTION OF PUBLISHED AMBIENT NOISE DATA.
Technical note Jun 72-Jun 73,
Barry A. Gold, and Joseph X. Palumbo. Oct 73, 18p Rept no. NOO-TN-6160-9-73
Prepared in cooperation with Acoustic Environmental Support Detachment, Arlington, Va. Rept. no. AESD-TN-73-04.

Descriptors: (*Underwater sound, Reports), (*Oceans, Noise), Arctic Ocean, Atlantic Ocean, Pacific Ocean, Mediterranean Sea, Wind, Statistical data.
Identifiers: Ambient noise.

The report presents the numerical distribution of reports contained in the AESD computerized ambient noise bibliography as a function of ocean areas. A numerical break down according to topics directly relating to ambient noise is also given. (Author)

AD-768 903/7GA PC$4.25/MF$1.45
Texas A and M Univ College Station Dept of Oceanography
GEOLOGY AND GEOPHYSICS OF THE BEATA RIDGE -CARIBBEAN.
Technical rept.,
Lamar B. Roemer, William R. Bryant, and Davis A. Fahlquist. Sep 73, 109p Rept no. A/M-Ref-73-14-T
Contract N00014-68-A-0308, Grant NSF-GA-1296

Descriptors: (*Marine geology, *Caribbean Sea), (*Ocean bottom topography, Caribbean Sea), Seismology, Faults(Geology), Terrestrial magnetism.
Identifiers: *Beata Ridge, Seismic reflection, Ocean ridges, Seismic profiles, Bathymetry, Plate tectonics.

Interpretation of bathymetric, magnetic and seismic reflection surveys in the Beata Ridge region provide evidence for two distinct geologic provinces: (1) the Beata Ridge system; and (2) a Late Cenozoic deformational fold belt north of Venezuela and Colombia. The Beata Ridge is a structural high produced by at least three periods of differential uplift with the earliest faulting in the Late Cretaceous or Early Tertiary. The western side of the ridge is marked by a prominent fault. To the south the scarp is replaced by a series of smaller horsts and grabens. The deformational fold system parallels the northern coast of South America and may have resulted from the Caribbean plate colliding with the Americas plate. The analytical models of potential faults by Hafner (1951) and Sanford (1959) have been tested on the Beata Ridge. The close agreement between theoretical predictions and the observed structure of the basement underlying the ridge is good enough for application of the model on a regional scale. However, the deformation of the sedimentary veneer is primarily by folding accompanied by secondary faulting. (Modified author abstract)

AD-768 909/4GA Reprint
Woods Hole Oceanographic Institution Mass
GEOPHYSICAL STUDY OF THE NORTHWEST AFRICAN MARGIN OFF MOROCCO.
Technical rept.,
Bruce P. Luyendyk, and Elizabeth T. Bunce. 22 Dec 72, 22p Rept nos. WHOI-73-70, WHOI-Contrib-2805
Contract N00014-66-C-0241, Grant NSF-GA-27516
Revision of report dated 11 Feb 71.
Availability: Pub. in the Deep Sea Research, v30 p537-549 1973.

Descriptors: (*Continental shelves, *Morocco), (*Canary Islands, Continental shelves), Terrestrial magnetism, Ocean bottom, Stratigraphy.
Identifiers: Bathymetry, Seismic profiles, Tectonics, Continental slopes, Submarine topographic features.

It is the purpose of this paper to describe the general structure of the African continental rise and environs off Morocco, primarily determined by marine geophysical measurements.

AD-768 995/3GA PC$4.25/MF$1.45
Miami Univ Fla Inst of Marine and Atmospheric Sciences
LONG RANGE ACOUSTIC PROPAGATION PROJECT. BLAKE TEST SYNOPSIS REPORT.
Technical rept.,
Scott C. Daubin, and John P. Nardello. 1973, 44p
Contract N00014-67-A-0201-0024
Prepared in cooperation with Hydrospace-Challenger, Inc., Rockville, Md.

Descriptors: (*Oceanographic equipment, Tests), Acoustic equipment, Checkout procedures, Noise, Hydrophones, Electronic equipment, Navigation satellites, Safety, Seismographs, Radio beacons.
Identifiers: Bathymetry.

The ACODAC exercise known as the BLAKE TEST was an outgrowth of the LRAPP environmental acoustics operation in the Caribbean during the fall of 1972. This exercise raised some questions regarding the self noise of ACODAC systems and the overall performance of the hydrophone array which had broken free and from which no usable data were recovered. The BLAKE TEST also served as a training precursor for the extensive series of ACODAC deployments scheduled for the Pacific in 1973 from R/V NORTH SEAL.

AD-769 094/4GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
DEEP-SEA ZEOLITES: VARIATIONS IN SPACE AND TIME IN THE SEDIMENTS OF THE INDIAN OCEAN,
Kolla Venkatarathnam, and Pierre E. Biscaye. 25 May 73, 9p Rept no. LDGO-1972
Contracts N00014-67-A-0108-0004, AT(11-1)3132
Sponsored in part by Grant NSF-GA-35454.
Availability: Pub. in Marine Geology, v15 pM11-M17, 25 May 73.

Descriptors: (*Ocean bottom, *Indian Ocean), (*Clay minerals, Indian Ocean), Sedimentation, Marine geology.
Identifiers: *Zeolites, *Clinoptilolite, Geomorphology, *Phillipsite.

In the Indian Ocean, the zeolite phillipsite is often found in Miocene and younger sediments and is confined to the central areas of the sea floor. This zeolite forms from the alteration of basic volcanic material and does not require much time for its formation. Another zeolite, clinopilolite, however, is most often restricted to Cretaceous to Eocene sediments in areas closer to the continental land masses. This distribution in space and time is thought to be due to the availability of silicic volcanics during the early formation of the Indian Ocean in the Cretaceous to Eocene time. The mobilization of silica from opal-rich sediments during these times may also have been an important factor in the formation of clinoptilolite. (Author)

COM-73-11743/4GA PC$2.75/MF$1.45
North Carolina State Univ. Raleigh. Center for Marine Coastal Studies.
CTD SENSORS, SPECIFIC CONDUCTANCE AND THE DETERMINATION OF SALINITY,
C. E. Knowles. Aug 73, 16p NCSU-73-3, UNC-SG-73-16 NOAA-73092402
Contract NOAA-2-35178, Grant NOAA-043-158-40

Descriptors: (*Salinity, Sea water), (*Sea water, Electrical resistivity), Temperature, Chlorinity, Oceanographic data, Detectors, Tables(Data), Red Sea.
Identifiers: Sea Grant Program.

To convert the specific conductance C(S, t, p) measured by an in situ CTD sensor to salinity in a manner consistent with the international standard reexpression proposed by Cox et al, it is necessary to have established a means of estimating the specific conductance of seawater having a salinity of 35 parts per thousand, C(35, t, 0). Third order polynomial expressions for one Red Sea Water and two Normal Water samples, each having a salinity of 35 parts per thousand, are formulated and discussed. From the results of this study, it is recommended that an international expression for C(35, t, 0) be established, and in the interim, one of the expressions formulated by this study be used. (Author)

COM-73-11756/6GA PC$12.75/MF$1.45
Alaska Univ., College. Inst. of Marine Science.
A REVIEW OF THE OCEANOGRAPHY AND RENEWABLE RESOURCES OF THE NORTHERN GULF OF ALASKA,
Donald H. Rosenberg. Feb 72, 690p* IMS-R72-23, Sea Grant-73-3 NOAA-73101009
Grant NOAA-043-158-41
Sponsored in part by Western Oil and Gas Association, Los Angeles, Calif.

Descriptors: (*Alaska Gulf, *Oceanography), (*Fisheries, Alaska Gulf), Marine biology, Oils, Hydrology, Geology, Geomorphology, Shellfish, Crabs, Shrimps, Clams, Mammals, Birds, Trout, Salmon, Pacific coast, Reviews, Natural resources, Wildlife.
Identifiers: Sea Grant program.

A broad review of the present state of knowledge of the oceanography and renewable marine resources of the Northern Gulf of Alaska is presented. Twenty-two studies are encompassed and these deal with the physical, chemical, and biological aspects of the oceanography of the area. Encompassed also are studies on the: Intertidal region, coastal weather, tides; wind waves; oil and gas seeps; land hydrology; geology; geomorphology; mammals; and birds. Fisheries of the region are treated in considerable detail.

COM-73-11821/8GA Reprint
National Oceanic and Atmospheric Administration, Miami, Fla. Atlantic Oceanographic and Meteorological Labs.
PALAEOTEMPERATURE AND COHESION IN GLOBIGERINA OOZE SEDIMENT CORES FROM THE CARIBBEAN SEA,
R. H. Bennett. 10 Nov 71, 26p NOAA-73100406
Pub. in Nature Physical Science, v240 n101 p114-116, 4 Dec 72.

Descriptors: (*Oozes, Cohesion), (*Paleoclimatology, Caribbean Sea), Sediments, Vane shear tests, Ocean bottom, Temperature.

Two sediment cores of Globigerina ooze from the Caribbean were selected for study. A total of 81 vane shear measurements were performed at selected depths corresponding as closely as possible to depths at which oxygen isotope analyses of pelagic tests had been determined earlier. The relative variation in cohesion with depth for both cores showed a strong relationship to sediment texture and a correlation with palaeotemperature variations. Cohesion is not a function of palaeotemperature but rather is influenced significantly by the size of the carbonate tests which are responsive to temperature. These relationships appear to be valid for the depositional environment in the area from which these cores were collected. Similar relationships may not exist for other deep-sea environments.

COM-73-11837/4GA Reprint
Rhode Island Univ., Kingston. Dept. of Ocean Engineering.
A TURBIDITY SURVEY OF NARRAGANSETT BAY,
Hilbert Schenck, Jr., and Albert Davis. 1973, 11p NOAA-73101105

Pub. in Ocean Engineering, v2 p169-178 1973.

Descriptors: (*Narragansett Bay, Turbidity), Rhode Island, Attenuation, Estuaries, Periodic variations, Suspended sediments.
Identifiers: Sea Grant program.

A turbidity survey of Narragansett Bay, Rhode Island, was made during the summer months of 1971 and included measurements of the attenuation function for scalar irradiance for daylight and the volume attenuation function for white tungsten light at various depths. One hundred and three stations were made at 17 different locations. Variations in the optical parameters were large, one standard deviation at any given location ranging from 7 to 23 percent of the mean value. This variation was only slightly dependent on the state of the tidal currents, depth of the location, or weather factors. The magnitude of turbidity variations was almost 4-fold over a north-south range of 31 km within the estuary, with clearest water at the southern mouths of the Bay. A good correlation exists between turbidity parameters and Autumn values of suspended-material concentration found by Morton (1967), with both data sets showing highest turbidity and suspended concentrations in the West Passage of the Bay. 'Wedges' and 'bulges' of clear water were detected throughout the Bay but were most evident at the southern (Atlantic Ocean) end. (Modified author abstract)

COM-73-11838/2GA Reprint
Rhode Island Univ., Kingston. Graduate School of Oceanography.
FACTORS AFFECTING THE ASSOCIATION OF FATTY ACIDS WITH MINERAL PARTICLES IN SEA WATER,
Phillip A. Meyers, and James G. Quinn. 5 Feb 73, 16p NOAA-73101008
Contract NOAA-2-35190
Revision of report dated 14 Aug 72.
Pub. in Geochimica et Cosmochimica Acta, v37 p1745-1759 1973.

Descriptors: (*Sea water, Fatty acids), (*Sediments, *Fatty acids), Minerals, Ocean bottom, Adsorption, Clay minerals, Bentonite, Kaolinite, Illite, Montmorillonite, Calcite, Temperature, pH, Rhode Island.
Identifiers: Sea Grant Program.

Transport and release of fatty acids by clay minerals, calcite and marine sediments have been investigated. The adsorption of heptadecanoic acid by bentonite clay at four parts per thousand was nearly triple that at zero parts per thousand. However from four parts per thousand to thirty-five parts per thousand, only a minor adsorption increase occurred. Bentonite and kaolinite were found to be the most adsorptive minerals investigated, followed in order by illite, montmorillonite and calcite. Sediments from Narragansett Bay were found to lie between illite and montomorillonite in adsorptive capacity after indigenous sediment organic matter had been removed. Sediment organic matter reduced fatty acid uptake by a factor of 1.6. (Modified author abstract)

COM-73-50873/1GA PC-GPO/MF$1.45
National Oceanographic Data Center, Washington, D.C.
USER'S GUIDE TO NODC'S DATA SERVICES.
Feb 73, 77p NOAA-73083003
Key to Oceanographic Records Documentation no. 1.
Paper copy available from GPO $1.00 as C55.219/3:1.

Descriptors: (*Oceanography, Information centers), (*Oceanographic data, Information retrieval), Meteorological data, Information systems, Marine meteorology, Marine biology, Marine geology, Bathythermograph data, Marine geophysics, Ocean currents, Tables(Data).

Key to Oceanographic Records Documentation No. 1 User's Guide to NODC's Data Services, February 1973, supersedes NODC Publication G-15, User's Guide for NODC's Data Processing Systems, 1969, of the former NODC General Series. The Guide is prepared to help users of NODC's services formulate request for data and related information. It describes data bases and formats in which data can be obtained, contains examples of data listings, summaries, and displays, and explains entries and codes used in printout formats. (Author)

COM-73-50887/1GA PC-GPO/MF$1.45-NTIS
National Marine Fisheries Service, Seattle, Wash.
BOTTOM-WATER TEMPERATURES ON THE CONTINENTAL SHELF, NOVA SCOTIA TO NEW JERSEY.
Technical rept.,
John B. Colton, Jr., and Ruth R. Stoddard. Jun 73, 59p NOAA-TR-NMFS-Circ-376 NOAA-73091401
Paper copy available from GPO $0.60 as C55.13:NMFS-CIRC-376.

Descriptors: (*Ocean botton, *Temperature), (*Continental shelves, Temperature), Benthos, Oceanographic data, Periodic variations, Nova Scotia, Coasts, North Atlantic Ocean, New England.

This paper presents 15 charts of monthly average bottom-water temperatures and of long-term annual minimum and maximum bottom-water temperatures in the area of the continental shelf between Nova Scotia and New Jersey. It is believed that the charts do give a general picture of the maximum range of temperature to which resident populations of benthic animals in various regions could be subjected.

E73-11099/GA PC$3.00/MF$1.45
Geological Survey, Menlo Park, Calif.
PRINCIPAL SOURCES AND DISPERSAL PATTERNS OF SUSPENDED PARTICULATE MATTER IN NEARSHORE SURFACE WATERS OF THE NORTHEAST PACIFIC OCEAN AND SEASONAL VARIATION IN SNOW COVER IN THE SIERRA NEVADA.
Progress rept. 1 Jun-15 Aug 73,
Paul R. Carlson, and Deborah R. Harden. 20 Aug 73, 14p NASA-CR-135568
Contract NASA Order S-70243-AG

Descriptors: Sediment transport, Pacific Ocean, Surface water, Snow cover, Sierra Nevada Mountains(CA), Coastal water, Annual variations, Earth resources program, Water flow, Photointerpretation, Water circulation.

The author has identified the following significant results. ERTS-1 imagery used in conjunction with the surface-drift cards indicated a southerly flow direction of the central California near surface coastal currents during mid-June 1973. The near-surface currents off northern California and southern Oregon were more complex. Some drift cards were recovered north and some south of their release points:; HOWEVER, THE PREVALENT DIRECTION OF FLOW WAS NORTHERLY. General agreement in flow direction of coastal currents obtained from ERTS-1 imagery and drift card data reinforces the image interpretation. Complete seasonal coverage of nearshore circulation interpreted from ERTS-1 imagery will provide information necessary for proper coastal zone management. Extent of snow cover can be readily delimited on ERTS-1 band five. In the central Sierra Nevada Mountains this past winter season, the snow line, as recorded by ERTS-1, reached an elevation of less than 1500 meters in January but had melted back to between 2500 and 3000 meters by the end of May. ERTS-1 imagery seems to provide sufficient resolution to make it a useful tool for monitoring changes in snow cover in the Sierra Nevada Mountains.

N73-31355/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
RESEARCH NEEDS IN OCEAN COLOR DATA ANALYSIS.
W. R. Mccluney. Sep 73, 17p NASA-TM-X-70466, X-652-73-261

Descriptors: *Color photography, *Oceanography, *Remote sensors, Ocean bottom, Optical properties, Parameterization, Pattern recognition, Sea water, Statistical analysis.

For abstract, see STAR 1122

N73-31360/3GA PC$9.50/MF$1.45
Grumman Aerospace Corp., Bethpage, N.Y.
PHOTOMETRIC AND POLARIMETRIC MAPPING OF WATER TURBIDITY AND WATER DEPTH.
Final Report.
J. Halajian, and H. Hallock. Aug 73, 148p NASA-CR-134030
Contract NAS9-12963

Descriptors: *Photometry, *Polarimetry, *Turbidity, Data acquisition, Data processing, Depth measurement, Remote sensors.

For abstract, see STAR 1122

PB-224 499/4GA PC$3.50/MF$1.45
Woods Hole Oceanographic Institution, Mass.
REPORT ON A NEW UNDERWAY SEDIMENT SAMPLER.
Technical rept. Jan-Feb 73,
Jeffrey P. Ellis. Jun 73, 26p WHOI-73-35

Descriptors: (*Sediments, *Samplers), Performance evaluation, Design, Instruments, Data, Continental shelves, Brazil.
Identifiers: *Ocean bottom sampling, Oceanographic equipment.

In the course of preparation for a preliminary geological and geophysical survey of the Brazilian continental margin, an underway sediment sampler was designed. The function of this device was to obtain surface sediment samples without having to stop the survey vessel. Relatively inexperienced personnel were able to obtain adequate samples from a variety of bottom types and water depths in minimum amounts of station time and with minimum equipment loss. (Author)

8K. Seismology

AD-768 586/0GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
ENHANCEMENT OF LONG-PERIOD SIGNALS BY TIME-VARYING ADAPTIVE FILTERS,
George Choy, and Keith McCamy. 26 Feb 73, 9p
Rept no. LDGO-1971 AFOSR-TR-73-1822
Contract F44620-71-C-0082, ARPA Order-1774
Revision of report dated 1 Aug 72.
Availability: Pub. in Jnl. of Geophysical Research, v78 n17 p3505-3511, 10 Jun 73.

Descriptors: (*Seismic waves, Band-pass filters), Rayleigh waves, Polarizing filters, Signal-to-noise ratio, Earthquakes, Explosions.
Identifiers: Seismic discrimination, Adaptive filters, Time varying systems, Love waves.

Filters employing a time-varying response are applied to long-period (20-60 sec) digital data from the Lamont-Doherty high-gain long-period seismograph stations. To enhance Love waves, an azimuthal filter designed that passes only energy approaching the stations from a desired azimuth. For the enchancement of signal-to-noise ratio for small earthquakes M9b) < 5.0) greater than that obtained by either matched or passive (e.g., band-pass or low pass) filtering. (Author) These filters have resulted in an enhancement of signal-to-noise

ratio for small earthquakes M(b) < 5.0) greater than that obtained by either matched or passive (e.g., bandpass or low pass) filtering. (Author)

AD-768 596/2GA Reprint
Hawaii Inst of Geophysics Honolulu
CRUSTAL TILT FIELDS AND PROPAGATION VELOCITIES ASSOCIATED WITH EARTHQUAKES,
E. Berg, and W. Lutschak. 1973, 7p Rept no. HIG-Contrib-415 AFOSR-TR-73-1787
Contracts F44620-71-C-0105, AT(65-1)-2229
Availability: Pub. in Philosophical Transactions of the Royal Society of London, v274 n1239 p261-265 1973.

Descriptors: (*Earthquakes, Data processing systems), Seismic waves, Alaska, Seismological stations, Strain(Mechanics), Velocity, Wave transmission.
Identifiers: Amplitude, Signal processing.

Three borehole installations of 15 s horizontal pendulums (of the Lamont lunar type) with capacitance displacement transducers were carried out in 1968-1969 in Central Alaska in Gilmore, Patson, and McKinley in the Alaska Range. Tilt steps similar to strain steps have been observed for earthquakes with magnitude from 2 to 8 and distances ranging from 10 to 9000 km. The tilt step propagation velocity from the hypocenter to the station increases from about 1.3 km/s near the epicentral area to 2.6 to 2.8 km/s at 60 to 80 km and to 3.1 km/s at teleseismic distances. Tilt directions, amplitudes and velocities observed at several stations simultaneously for the same earthquake are internally consistent. For local Fairbanks quakes the data from the Alaska long period array (ALPA) also have been used and span a full quadrant from the epicentre. There is an indication that tilt amplitudes depend on the tectonic environment of the station. Examples of tilts from local and regional earthquakes are presented and observations from teleseismisms include the 10 Jan 1971 (M = 8.1) New Guinea, the 9 Jul 71 (M = 7.7) Chile and the 14 Jul 71 (M = 8.1) Solomon Island earthquakes. (Modified author abstract)

AD-768 637/1GA PC$3.00/MF$1.45
Teledyne Geotech Alexandria Va Alexandria Labs
A LEAST-SQUARES PROCEDURE FOR DIRECT ESTIMATION OF AZIMUTH AND VELOCITY OF A PROPAGATING WAVE,
E. A. Flinn, and D. W. McCowan. 3 Aug 73, 40p
Rept no. AL-72-8 AFOSR-TR-73-1405
Contract F44620-69-C-0082, ARPA Order-1357

Descriptors: (*Earthquakes, *Rayleigh waves), (*Nuclear explosions, *Microbarometric waves), Seismic waves, Airburst, Signal-to-noise ratio, Least squares method, Algorithms, Alaska, Velocity.
Identifiers: Gravity waves, Acoustic gravity waves, Signal processing, Plane waves, Phase velocity.

A least-squares technique for the estimation of the phase velocity and apparent azimuth of a plane wave propagating across a horizontal array is developed and applied to two events: the Rayleigh waves from an Alaskan earthquake recorded on the 7-element UBO long-period seismic array, and the acoustic-gravity waves from a presumed atmospheric nuclear explosion, recorded on part of the 13-element microbarographic array at LAMA. Both time-domain and frequency-domain formulations of the technique were used, i.e., both the multichannel correlation and spectral matrices are used to measure the interchannel time shifts. The results suggest that the time-domain application may provide a useful algorithm for signal detection. The phase velocity dispersion results in both cases agree reasonably well with theory and with group velocities calculated by another method. Prewhitening (Flattening the spectral peaks by linear filtering) was tested as a means of preventing spectral leakage from contaminating the derived phase velocity and azimuth; the results suggest that prewhitening decreases the standard error when the signal-to-noise ratio is high, but is ineffective when the signal-to-noise ratio is low. (Author)

AD-768 641/3GA Not available NTIS
Alberta Univ Edmonton Dept of Physics
A DIGITAL SEISMIC RECORDING SYSTEM,
D. F. Allsopp, M. D. Burke, and G. L. Cumming. 10 Apr 72, 7p
Availability: Pub. in the Bulletin of the Seismological Society of America, v62 n6 p1641-1647 Dec. 72.

Descriptors: (*Seismic waves, *Digital recording systems), Analog-to-digital converters, Band-pass amplifiers, Performance(Engineering), Canada.
Identifiers: Seismic reflection.

A multi-channel seismic system which records directly on a nine-track synchronous digital tape is described. Low-noise amplifiers with a band-pass of 0.1 to 50 Hz coupled with a 14-bit A to D converter provide the wide-frequency response and dynamic range necessary for high-quality recording of seismic reflection signals from the deep crust. (Author)

AD-768 710/6GA PC$3.50/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
SEISMIC REFRACTION EXPLORATION FOR ENGINEERING SITE INVESTIGATIONS.
Technical rept.,
Bruce B. Redpath. Aug 73, 62p Rept no. AEWES-TR-E-73-4

Descriptors: (*Geophysical prospecting, *Seismographs), Reviews.
Identifiers: *Seismic refraction method, Subsurface investigations.

The report is a summary of the theory and practice of using the refraction seismograph for shallow, subsurface investigations. It is intended to be a guide to the application of the technique and not a comprehensive analysis of every aspect of the method. The report begins with the fundamentals and then progresses from time-intercept calculations to interpretations using delay times. The limitations of this exploration tool are discussed, and other applications of the equipment, such as uphole surveys, are described. The report also recommends field procedures for carrying out refraction surveys. (Author)

AD-769 031/6GA Not available NTIS
British Columbia Univ Vancouver Dept of Geophysics
MULTIPLE REFLECTION OF PLANE SH WAVES BY A DIPPING LAYER,
Hiroshi Ishii, and Robert M. Ellis. 8 Apr 69, 15p
Availability: Pub. in Bull. of the Seismological Society of America, v60 n1 p15-28 Feb 70.

Descriptors: (*Seismic Waves, Reflection), Velocity, Diffraction, Refraction, Canada.
Identifiers: Phase velocity, Wave equations.

The problem of plane SH wave incident at the base of a dipping layer has been considered. A solution by multiple reflection for waves incident at any angle perpendicular to strike has been obtained for the amplitude, phase and phase velocity. Numerical values are calculated on the surface. It is found that the phase velocities vary rapidly with both period of the wave and depth to the interface, particularly for propagation directions close to an angle which corresponds to vertical incidence in the horizontally layered case. (Author)

AD-769 032/4GA Not available NTIS
British Columbia Univ Vancouver Dept of Geophysics
MULTIPLE REFLECTION OF PLANE SH WAVES BY A DIPPING LAYER,
Hiroshi Ishii, and Robert M. Ellis. 8 Apr 69, 15p
Availability: Pub. in Bull. of the Seismological Society of America, v60 n1 p15-28 Feb 70.

Descriptors: (*Seismic Waves, Reflection), Velocity, Diffraction, Refraction, Canada.
Identifiers: Phase velocity, Wave equations.

The problem of plane SH wave incident at the base of a dipping layer has been considered. A solution by multiple reflection for waves incident at any angle perpendicular to strike has been obtained for the amplitude, phase and phase velocity. Numerical values are calculated on the surface. It is found that the phase velocities vary rapidly with both period of the wave and depth to the interface, particularly for propagation directions close to an angle which corresponds to vertical incidence in the horizontally layered case. (Author)

COM-73-11854/9GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Environmental Research Labs.
DETERMINING MAXIMUM LIKELIHOOD BODY WAVE FOCAL PLANE SOLUTIONS,
W. H. Dillinger, S. T. Harding, and A. J. Pope. 28 Jun 72, 16p NOAA-73092509
Prepared in cooperation with National Geodetic Survey, Rockville, Md. Geodetic Research and Development Lab.
Pub. in Geophysical Jnl. Royal Astronomical Society, v30 p315-329 1972.

Descriptors: (*Earthquakes, *Seismic waves), Primary waves, Secondary waves, Polarization.

Earthquake focal plane solutions are computed using P wave first motion, S wave polarization angles, and combinations of the two. The method used is based on a maximum-likelihood argument implemented by the generation of a score surface on a discrete grid. The combined score is of the form a(P-score) + b(S-score). For the P-solution and S-solution, the computer system also produces contoured fiducial regions about the poles of the focal planes. This permits an evaluation of the quality of the solutions and makes possible the comparison of solutions for different earthquakes. These contoured limits have a probabilistic interpretation as 95 per cent fiducial regions, a term explained by Pope. A new graphical method for P wave solutions makes possible the construction of exact boundaries of the regions. The Aleutian earthquake of 1969 May 14, is analysed, and the solution shows good agreement between the observed P wave first motions and the S polarization angles. (Author)

COM-73-11855/6GA Reprint
National Ocean Survey, Rockville, Md. Geodetic Research and Development Lab.
FIDUCIAL REGIONS FOR BODY WAVE FOCAL PLANE SOLUTIONS,
A. J. Pope. 28 Jun 72, 14p NOAA-73092508
Pub. in Geophysics Jnl. Royal Astronomical Society, v30 p331-342 1972.

Descriptors: (*Earthquakes, Seismic waves), Primary waves, Secondary waves.

The method of maximum likelihood is applied to find solutions for the focal plane parameters of an earthquake using P wave first motions and using S wave polarization angles. The solution is carried out numerically by generating likelihoods over a discrete grid covering the parameter space. The likelihood values are contoured to show regions of maximum likelihood. By an appropriate calibration of the contours of these regions, they can be interpreted as fiducial regions that express the quality of the focal plane determination. Alternative interpretations of these regions are discussed at some length as instances of the general problems of constructing confidence regions. This

paper gives the necessary statistical background material for the paper (Determing Maximum Likelihood Focal Plane Solutions, Dillinger, Harding and Pope) but may be read separately. (Author)

FOA-4-4538-A-1/GA PC$3.75/MF$1.45
Hagfors Observatory, Stockholm (Sweden).
EARTHQUAKE IN THE CRIMEA REGION, JULY 22, 1972. EVENT REPORT NO. 6.
May 73, 32p
U.S. Sales Only.

Descriptors: (*Earthquakes, *Seismic detection), (*Nuclear explosion detection, *Seismic waves), S waves, Seismic p waves, Ussr.

For abstract, see NSA 28 08, number 18207.

PB-224 134/7GA PC$12.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
NONLINEAR AND COUPLED SEISMIC EFFECTS. REPORT NO. 2. AMPLIFICATION STUDIES FOR A NONLINEAR HYSTERETIC SOIL MODEL.
Research rept.,
I. V. Constantopoulos, J. T. Christian, and J. M. Roesset. Sep 73, 203p R73-46, Soils Pub-329 NSF-GI-35139-2
Also available as Structures Pub-376.

Descriptors: (*Earthquakes, *Soil dynamics), Soil mechanics, Soil pressure, Dynamic response, Soil properties, Dynamic response, Iteration, Stress strain diagrams, Nonlinear systems, Theses.
Identifiers: Earthquake engineering.

The behavior of a nonlinear hysteretic model for soils under earthquake excitation is studied. A review of experimental data of variations of stiffness and damping with strain for soils led to the conclusion that Ramberg-Osgood systems can reasonably well model these properties. Then, the response of single and multidegree of freedom systems is computed by direct calculations of soil amplification using a Ramberg-Osgood model for the soil properties, and by the traditional iterative viscoelastic technique using variations of stiffness and damping derived from the same Ramberg-Osgood model. Graphs are obtained relating the level of the earthquake input to the response displacements, ductility ratios, accelerations and response spectra. Comparison of the results of the exact and the iterative technique shows that the response spectra are quite similar for the range of frequencies of engineering interest. There is, however, evidence that the iterative approach tends to underestimate the displacements and to overestimate the accelerations. (Author)

PB-224 171/9GA PC$7.50/MF$1.45
Hawaii Inst. of Geophysics, Honolulu.
FLUCTUATIONS IN CIRCUM-PACIFIC VOLCANIC ACTIVITY AND IN THE SEISMICITY OF SOUTH AMERICA,
Marion O. Michael. May 73, 106p HIG-73-11
Grant NSF-GA-30740, NSF-GX-28674

Descriptors: (*Volcanism, *Pacific Ocean), (*Earthquakes, *South America), Statistical analysis, Chi square test, Periodic variations, Seismology, Seismic epicenter, Theses.

Statistical analysis was performed on data for eruptions per annum in the volcanic areas of the circum-Pacific belt, and shallow, intermediate, and deep seismic activity in South America. Amplitudes of fluctuations are statistically significant, but show little serial correlation. On both eastern and western Pacific margins, large pulses of volcanic activity tend to migrate south with time; no such well-marked pattern was found for seismic activity in South America. Cross correlation between earthquake activity at various depths shows that intermediate seismic pulses occur before deep seismic pulses and often also before shallow pulses. Correlation was found to be low between eruption data and large magnitude seismic data from South America.

8L. Snow, Ice, and Permafrost

AD-768 827/8GA PC$3.00/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
BREAKING ICE WITH A JET OF GAS (RAZRUSHENIE LDA REAKTIVNOI GAZOVOI STRUEI),
G. N. Yakovelev. Aug 73, 19p Rept no. CRREL-TL395
Draft trans. of Arkticheskti i Antarkticheskii Nauchno-Issledovatelskii Institut. Trudy (USSR) v300 p153-167 1971.

Descriptors: (*Ice, Melting), (*Sea ice, Cutting), Jets, Gas flow, Material removal, Thermodynamics, Drilling, USSR.
Identifiers: Translations.

Thermodynamic methods are currently being applied successfully in industry for breaking rocks. These same methods have been examined for breaking ice. However, for large scale operations the use of a gas jet does not appear promising because of the large amount of energy required to melt ice. (Author)

AD-768 828/6GA PC$3.00/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
ISOSTATIC PHENOMENA ON ICE FLOES (IZOSTATICHESKIE YAVLENIYA NA DREIFUYUSHCHIKH LEDYANYKH POLYAKH),
Yu. L. Nazintsev. Aug 73, 14p Rept no. CRREL-TL394
Draft trans. of Arkticheskti i Antarkticheskii Nauchno-Issledovatelskii Institut. Trudy (USSR) v300 p101-109 1971.

Descriptors: (*Sea ice, *Isostatic change), Thickness, Density, Melting, Salinity.
Identifiers: Translations, *Floating ice.

Isostatic phenomena in drifting ice floes are caused by the uneven thawing and accretion of ice, by runoff of melt water, snow accumulation and other causes. The tendency of ice toward isostatic equilibrium is manifested not only in the variation in its settling general for the ice field but also in the plastic deformations of ice, i.e. in the vertical displacements of one part of the field relative to another, associated with local disruptions in the isostatic equilibrium. These disruptions develop continuously as a result, equilibrium is found only as a whole for the entire ice field or its large parts. Involving supplemental data, the authors show the possible application of an analysis of isostasy to certain ice calculations.

AD-768 829/4GA PC$3.25/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
CUTTING SEA ICE BY DIRECTED BLASTING (OPYT RAZRUSHENIYA MORSKOGO LDA NAPRAVLENNYM VZRYOVOM),
S. E. Nikolaev. Aug 73, 23p Rept no. CRREL-TL396
Draft trans. of Arktichasktii i Antarkticheskii Nauchno-Issledovatelskii Institut. Trudy (USSR) v300 p177-195 1971.

Descriptors: (*Sea ice, Cutting), Explosion effects, Explosive materials, Underwater explosions, Demolition, USSR.
Identifiers: Translations.

The use of directed blasting can prove a very effective means in solving a number of practical problems: the creation in the pripay (fast shore ice) of ice-free channels for the passage of ships with a weak hull, for laying pipes or cable from the ice surface, and so forth. Placing the charges according to a prescribed system and exploding them through brief time intervals in a fixed sequence can assure the directed removal of ice along the given direction. (Author)

AD-769 037/3GA Not available NTIS
Defence Research Establishment Ottawa (Ontario)
CLIMATIC CHANGE AND RELATED PROBLEMS IN NORTHERN ELLESMERE ISLAND, N.W.T., CANADA,
G. Hattersley-Smith. 1972, 14p Rept no. DREO-674
Symposium on Climatic Changes in Arctic Areas during the Last Ten-Thousand Years Held at Oulanka and Kevo, 4-10 Oct 71.
Availability: Pub. in Acta Universitatis Ouluensis, Series A, Scientiae Rerum Naturalium No. 3, Geologica No. 1, p137-148 1972.

Descriptors: (*Climatology, *Ellesmere Island), (*Glaciers, Ellesmere Island), Ice islands, Sea ice, Marine geology, Canada.
Identifiers: *Paleoclimatology.

The following topics are discussed: Inferences on climate in the last 10,000 years; The Ward Hunt Ice Shelf; Disraeli Fiord; Glacial lakes; Gilman Glacier and adjoining ice cap; Nansen Sound; Possible future investigations.

COM-73-11746/7GA PC$5.25/MF$1.45
National Ocean Survey, Detroit, Mich. Lake Survey Center.
GREAT LAKES ICE COVER-WINTER 1971-72.
Technical memo.,
R. A. Assel. Oct 72, 61p NOAA-TM-NOS-LSC-D-6 NOAA-73092805

Descriptors: (*Great Lakes, *Ice reporting), Data, Ice formation, Aerial surveys, Ice breakup, Winter, Weather.

Thirty-five ice charts were produced from data collected on 23 Lake Survey Center ice reconnaissance flights made on the winter of 1971-72. In addition, five summary ice charts, illustrating ice distribution patterns for short intervals during the winter over the entire Great Lakes, were produced from Lake Survey Center, United States Coast Guard, and Canadian ice reports. Freezing degree-day accumulations indicate that the 1971-72 winter was severe on western Lake Superior and near normal throughout the remainder of the Great Lakes. Ice formation was reported November 10 in western Lake Superior at Dulth Harbor and along the perimeter of all the Great Lakes by the end of January. The period of maximum ice cover varied from the second week of February to the last week of March for individual lakes. (Modified author abstract)

PB-224 475/4GA MF$1.45
National Academy of Sciences, Washington, D.C.
PERMAFROST: THE NORTH AMERICAN CONTRIBUTION TO THE SECOND INTERNATIONAL CONFERENCE.
Jul 73, 777p*
International Standard Book No. 0-309-02115-4. Prepared for the International Conference on Permafrost Held in Yakutsk, USSR, Jul 73. See also PB-222 484.
Paper copy available from National Academy of Sciences $32.00.

Descriptors: (*Permafrost, Research), (*Construction, Permafrost), Meetings, Thermal measurements, Frost penetration, Sediments, Geochemistry, Stratigraphy, Frost heave, Specific heat, Vegetation, Soil mechanics, Waste disposal, Ground water, Sound transmission, Forest fires, Geophysical prospecting, Pipelines, Pavements, Foundations, Water quality, Canada, Yukon Territory, Antarctic regions, Alaska.

The volume provides an up-to-date review of Canadian and U.S. research related to perennially frozen ground. It is the most comprehensive collection of papers to appear since 1963 when the results of the first international conference were distributed. Individual papers were prepared by North American scientists and technologists working in the area, and discuss fundamental properties and behavior of permafrost, engineering and construction problems in permafrost areas, and environmental, ecological, and resource development issues.

UCRL-73867/GA PC$3.75/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
SHOCK-WAVE STUDIES OF ICE AND TWO FROZEN SOILS.
D. B. Larson, G. D. Bearson, and J. R. Taylor. 4 Oct 72, 34p CONF-730708-1

Descriptors: (*Soils, *Shock waves), (*Ice, Shock waves), Brass, Cryogenics, Equations of state, Water.

For abstract, see NSA 28 07, number 17823.

8M. Soil Mechanics

AD-768 801/3GA PC$3.50/MF$1.45
Lehigh Univ Bethlehem Pa
INVESTIGATIONS OF THE PLANT COMMUNITY-SOIL-SOIL STRENGTH-MICROMORPHOLOGY RELATIONSHIPS IN COASTAL MARSHES.
Final rept. 1 Jun 72-31 Jul 73,
J. Donald Ryan, and Thomas Everitt. Sep 73, 67p AROD-10481:1-EN
Grant DA-ARO-D-31-124-72-G93

Descriptors: (*Swamps, *Soil mechanics), Plants(Botany), Flexural strength, Silt, Clay, Particle size, Organic materials, Density, Moisture, Sampling, Visual inspection, Test methods, New Jersey, Seacoast.
Identifiers: Coastal marshes, Sediments, Vane shear tests.

An investigation of the geotechnical and morphological properties of two salt marshes in southeastern New Jersey was conducted from June 1972 until July 1973. The major objectives of the investigation were to obtain data on the dynamics of tidal marsh soil systems as they affect soil strength throughout the tidal cycle, and to obtain data on the relationships of plant community to soil strength. Three major environments of each marsh were investigated. These included (1)short Spartina alterniflora and mixed short S. alterniflora and Distichlis spicata areas, (2) tall Spartina alterniflora areas along tidal channels, and (3) the tidal channels themselves which are barren of vegetation. Each of these environments was investigated through the tidal cycle. This report presents the results of the above investigations. (Author)

AD-768 919/3GA PC$4.50/MF$1.45
City Coll Research Foundation New York
STRESS WAVE PROPAGATION THROUGH EARTH-WATER SYSTEMS.
Final rept.,
Carl J. Costantino. Sep 73, 134p
Contract DAHC19-69-C-0032, ARPA Order-1408
See also AD-738 094.

Descriptors: (*Soil mechanics, *Water waves), Stresses, Nonlinear systems, Strain(Mechanics), Compressive properties, Numerical analysis, Ocean waves.
Identifiers: Stress waves, Finite element analysis, Soil water, SLAM computer code, Triaxial tests, Embankments.

The report presents results of a study to include the effects of pore water on the response of soils to transient loadings. Numerical results are presented for problems which fall into different categories, in an attempt to span the problem areas of general interest. The first set of problems was concerned with computation of soil response to loadings in configurations which would be encountered in the laboratory, namely, triaxial and uniaxial configurations. The second set of problems was concerned with the impact of entrapped pore fluid on wave propagation velocities. The last two problem sets have to do with a study of submerged, off-shore soils to transient ocean storm waves, a problem area receiving more and more consideration as off-shore construction increases (platforms, nuclear reactor stations, protective dikes, etc.). The approaches used appear to offer an attractive solution technique to this important class of problems.

AD-768 983/9GA PC$4.50/MF$1.45
Oxford Univ (England) Dept of Agricultural Science
THE COST-EFFECTIVENESS OF TERRAIN EVALUATION. VOLUME 1. OUTLINE OF PROJECT: FIELD WORK IN 1971.
Final technical rept.,
P. H. T. Beckett. Sep 73, 131p
Contract DAJA37-71-C-0697

Descriptors: (*Soils, Geological survey), Terrain, Mapping, Cost effectiveness, Great Britain.
Identifiers: *Soil surveys, Soil classification.

The aim of this project is to analyse the influence of all relevant choices between procedures for sampling, classifying, and mapping soils or soil properties, and for evaluating and presenting soils information, on the truth and reliability of the result. The results are expected also to be applicable to maps, etc., of the other terrain properties. (Author)

AD-769 091/0GA Not available NTIS
Arctic Inst of North America Washington D C
ALASKAN ARCTIC TUNDRA.
Technical paper,
Max E. Britton. Sep 73, 225p Rept nos. AINA-TR-17, AINA-TP-25
Contract N00014-70-A-0219-0001
Proceedings volume of the Anniversary Celebration of the Naval Arctic Research Laboratory (25th), Alaska Univ., 14 Aug 72.
Availability: Paper copy available from The Arctic Institute of North America, 1619 New Hampshire Ave., N.W., Washington, D.C. 20009. PC$7.50.

Descriptors: (*Soils, Alaska), (*Permafrost, Alaska), Ice, Terrain, Drainage, Erosion, Melting, Freezing, Swamps, Glaciers, Plants(Botany), Photosynthesis, Ecology, Micrometeorology, Snow, Hydrology, Marine biology, Arctic regions, Symposia.
Identifiers: *Tundra, Frozen soils, Limnology.

Alaskan Arctic Tundra is the proceedings volume of the 25th Anniversary Celebration of the Naval Arctic Research Laboratory (NARL). There are 15 papers in the proceedings -- 7 speeches, 7 technical papers, and an introduction. Each technical paper focuses on a particular field of arctic terrestrial research supported by NARL. The authors reveal the results of their work at NARL and review the efforts of others in their research area. The papers include reviews of permafrost by J. Brown and P. V. Sellmann; North Slope morphology by H. J. Walker; pedology by J. C. F. Tedrow; micrometeorology by J. J. Kelley; limnology by J. E. Hobbie; tundra vegetation by P. O. Johnson and L. L. Tieszen; and Lemming ecology by F. A. Pitelka. (Modified author abstract)

8N. Terrestrial Magnetism

COM-73-11765/7GA PC$3.00/MF$1.45
California Univ., Los Angeles. Dept. of Planetary and Space Science.
HYDROMAGNETIC PROCESSES IN THE EARTH'S CORE AND THE ORIGIN OF THE GEOMAGNETIC SECULAR VARIATION.
Final rept. Oct 72-Sep 73,
Durward D. Skiles. 30 Sep 73, 11p NOAA-73092515
Grant NOAA-043-022-18

Descriptors: (*Geomagnetism, *Earth core), (*Magnetohydrodynamics, Earth core), Wave propagation, Attenuation.

This report indicates that the studies of the author have focused on the fundamental properties of hydromagnetic wave propagation in liquids with characteristics appropriate to the earth's fluid core. The work was motivated by the prevailing belief among geomagnetists that hydromagnetic waves in the core are responsible for much of the geomagnetic secular variation and perhaps play an essential role in the dynamo process. There are brief notes on evanescence in hydromagnetic waves, on hydromagnetic waves in viscous finitely conducting fluids, and finally there is a short discussion on geomagnetic secular variation.

N73-30332/3GA PC$5.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NEAR EARTH MAGNETIC DISTURBANCE IN TOTAL FIELD AT HIGH LATITUDES. 2: INTERPRETATION OF DATA FROM OGO'S 2, 4, AND 6.
R. A. Langel. Aug 73, 74p NASA-TM-X-70443, X-645-73-226
Subm-Submitted for Publication.

Descriptors: *Magnetic disturbances, *Magnetic fields, *Ogo, *Polar regions, Electrojets, Graphs (Charts), Ring currents.

For abstract, see STAR 1121

N73-30333/1GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NEAR EARTH MAGNETIC DISTURBANCE IN TOTAL FIELD AT HIGH LATITUDES. 1: SUMMARY OF DATA FROM OGO'S 2, 4, AND 6.
R. A. Langel. Aug 73, 36p NASA-TM-X-70442, X-645-73-225
Subm-Submitted for Publication.

Descriptors: *Magnetic disturbances, *Magnetic fields, *Ogo, *Polar regions, Annual variations, Tables (Data).

For abstract, see STAR 1121

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-768 656/1GA PC$3.75/MF$1.45
Dayton Univ Ohio Dept of Engineering Technology
EVALUATION OF RF CRIMP CONNECTORS (MIL-C-39012).
Technical rept. Jun 72-Jun 73,
Joseph M. Farren. Jun 73, 89p Rept nos. EET-58A, UDRI-TR-73-30
Contract F33601-72-C-0461
Continuation of Contract F33601-71-C-0624.

Descriptors: (*Electric connectors, Coaxial cables), Radiofrequency cables, Acceptability.
Identifiers: *Crimp connectors, Evaluation.

The purpose of the test series was to evaluate radio frequency coaxial crimp connectors in view of the requirements of MIL-C-39012B. It is significant to note that the problems encountered in performance of this test series was primarily caused

by the coaxial cables and the test procedures rather than the test samples themselves. The crimp connector samples generally displayed good performance with no serious deficiencies observed except in cases of erroneous dimensions or other manufacturing defects not characteristic of the samples themselves. (Author)

AD-768 705/6GA PC$3.00/MF$1.45
Army Electronics Command Fort Monmouth N J
SURFACE PREPARATION AND CHARACTERIZATION TECHNIQUES FOR QUARTZ RESONATORS.
Technical rept.,
J. Vig, H. Wasshausen, C. Cook, M. Katz, and E. Hafner. Aug 73, 48p Rept no. ECOM-4143

Descriptors: (*Quartz resonators, *Precision finishing), Quartz, Cleaning, Ion bombardment, Hydrogen peroxide, Surface properties.

An investigation was made of various polishing and cleaning techniques for quartz crystals. The surface topographies of polished crystals were investigated by transmission electron microscopy, with resolutions down to 15A. Large differences in surface qualities were revealed among crystals prepared with different polishing techniques. The polishing processes which to date produced the most defect-free surfaces are described. The surface crystallinities were investigated by high energy electron diffraction (HEED). Clearly defined Kikuchi lines were observed indicating that if there is a disturbed surface layer, its thickness is less than 100A. The effectiveness of the hydrogen peroxide based cleaning procedure was investigated by Auger electron spectroscopy. A fraction of a monolayer of carbon was the only observable contaminant on the surface after this procedure was used. Atomically clean quartz surfaces could be produced by ion bombardment cleaning, but the ion bombardment itself produced some undesired side effects. The effects of the electron beam and of the ion beam are discussed. (Modified author abstract)

AD-768 751/0GA PC$3.00/MF$1.45
Naval Ordnance Lab White Oak Md
SUSCEPTIBILITY OF SEMICONDUCTOR DEVICES TO THERMAL SECOND BREAKDOWN,
Norman S. Cohn. 21 Mar 73, 27p Rept no. NOLTR-73-90

Descriptors: (*Semiconductor devices, Nondestructive testing), (*Diodes(Semiconductor), Failure(Electronics)), Radiation damage, Electromagnetic pulses, Vulnerability, Thermal radiation, Electrical properties, Test methods.
Identifiers: *Second breakdown.

A method for determining the susceptibility of semiconductor devices to damage from an electromagnetic pulse (EMP) due to induced thermal second breakdown is described. The method can be used as a nondestructive screening test. It is based on the increase in junction reverse breakdown voltage with temperature and can be used to find the most EMP resistant devices of a given type. A mathematical explanation is presented, and other tentative applications are proposed. (Author)

AD-768 785/8GA PC$3.50/MF$1.45
Army Electronics Command Fort Monmouth N J
PHOSPHOR BRIGHTNESS AT HIGH VOLTAGE AND HIGH POWER DENSITY ELECTRON BEAM EXCITATION.
Technical rept.,
Isidore H. Stein. Oct 73, 61p Rept no. ECOM-4160

Descriptors: (*Cathode ray tube screens, Phosphorescent materials), (*Phosphorescent materials, Brightness), Luminescence, Fluorescent screens, Electron beams, Density, Thickness.
Identifiers: Cathodoluminescence, Current density.

Maximum brightnesses of 136,000, 56,000 and 13,400 foot lamberts were measured for P2, P1, and P24 phosphor screens, respectively, at high voltage (to 60 KV) and high power density (to 21 watts/sq cm) electron beam excitation. Increasing brightness with beam voltage and beam current reached maxima limited by deterioration of the excited phosphor area at the very high electron beam power densities (6.0-9.5 W/sq cm for the phosphors in this study). A range of phosphor screen thicknesses (1.7 - 15.6 mg/sq cm) was used in this study. An average value of 6.5 mg/sq cm for screen thickness gave optimum brightness results. (Author)

AD-768 786/6GA PC$2.75/MF$1.45
Battelle Columbus Labs Ohio
ON THE FEASIBILITY OF SLOW-WAVE-STRUCTURE CLOCKING OF HIGH-FREQUENCY CHARGE-COUPLED DEVICES.
Technical rept.,
R. Bharat. Oct 73, 20p ECOM-4161-72
Contract DAHC04-72-A-0001
Prepared by Denver Univ., Colo. Dept. of Electrical Engineering.

Descriptors: (*Semiconductor devices, Electrical properties), Carriers(Semiconductors), Space charges, Transfer functions, Electromagnetic waves, Design, Silicon.
Identifiers: *Charge coupled devices.

Coupling an electromagnetic wave through a slow-wave structure is proposed as a method of clocking a charge-coupled device (CCD), in order to obtain high charge-transfer efficiencies at high frequencies. The conditions necessary for synchronizing the velocity of the wave with the drift velocity of charge carriers in the CCD channel are derived. Meander-line clocking for operation of silicon CCDs in this traveling-wave mode appears to be feasible with present technology for clock frequencies in the range of 1 to 250 GHz. At synchronism, diffusion-limited inefficiency in charge transfer is eliminated, allowing operation at high frequencies where surface-state-limited inefficiency is negligible so that transfer efficiencies approaching 100% should be achievable. (Author)

AD-768 908/6GA PC$3.00/MF$1.45
Westinghouse Electric Corp Baltimore Md Systems Development Div
BINARY-ADDRESSABLE SCAN-CONVERSION STORAGE TUBE.
Quarterly rept. no. 7, 15 Apr-14 Jul 73,
Haden J. Bourg, and Gary Marx. Oct 73, 43p
ECOM-0052-7-72
Contract DAAB07-72-C-0052
See also Quarterly rept. no. 6, AD-767 272.

Descriptors: (*Storage tubes, Design), Electron tube parts, Manufacturing methods.

The objective of the contract is to conduct a research and development program leading to the fabrication, testing, and delivery of a binary-addressable scan-conversion storage tube. The tube is to be capable of simultaneous write and nondestructive read operation at video frequencies up to 10 megahertz. The progress during this quarter has included redesign of the control electrodes so that a capacitance decrease by a factor of 40 will be realized. In addition, the bus bar design used for multiplexing on wafers 3,4,5, and 6 has been changed in order to eliminate electrode crossovers and an oxidation step. (Modified author abstract)

AD-768 959/9GA PC$3.00/MF$1.45
International Business Machines Corp Hopewell Junction N Y East Fishkill Lab
RESIDUAL SAW DAMAGE IN SILICON WAFERS AND ITS INFLUENCE ON MOS CAPACITANCE RELAXATION.
Technical rept. no. 2, 6 Jun-30 Dec 72,
Guenter H. Schwuttke. 1 Jul 73, 42p* Rept no. Scientific-2
Contract DAHC15-72-C-0274, ARPA Order-2196

Descriptors: (*Silicon, Defects(Materials)), (*Capacitors, Reliability(Electronics)), Semiconductor devices, Surface properties, Etching, Electrical properties, Capacitance, Quality control, Electron microscopy, Thin film storage devices.
Identifiers: Metal oxide semiconductors, Transmission electron microscopy, Semiconductor computer storage.

Residual saw damage in silicon surfaces and its influence on MOS capacitance relaxation is discussed. Experiments are conducted to gain information on the influence of silicon process parameters on MOS capacitance relaxation. Process parameters investigated include: crystal slicing, wafer cleaning and wafer polishing. The main results of this investigation include evidence about saw damage in the silicon surface and its variation with different slicing and polishing procedures. It is also found that the amount of saw damage is larger in wafers cut from the tail-end relative to wafers cut from the seed-part of the crystal. Based on the results obtained, recommendations are made about future activities of the contract work. (Author)

AD-768 968/0GA PC$9.00/MF$1.45
IBM Thomas J Watson Research Center Yorktown Heights N Y
THE PHYSICS OF INTERFACE INTERACTIONS RELATED TO RELIABILITY OF FUTURE ELECTRONIC DEVICES.
Semi-annual technical rept. no. 1,
Thomas H. DiStefano, and King-Ning Tu. 31 Jan 73, 136p AFCRL-TR-73-0483
Contract F19628-73-C-0006, ARPA Order-2180

Descriptors: (*Semiconductor devices, Reliability(Electronics)), (*Semiconductors, Interfaces), Surface properties, Band theory of solids, Silicon, Semiconducting films, Niobium compounds, Europium compounds, Vanadium, Oxides, Electrical properties, Silicon dioxide, Dielectrics.
Identifiers: Metal oxide semiconductors, Dielectric breakdown.

Photoemission and thermionic emission results show that the Si-SiO2 energy barrier can be reduced from 4.2 eV to about 2.5 eV by a monolayer coverage of sodium. Scanning Internal Photoemission maps were made of the SiO2 interface which was 'stained' by a small amount of sodium. Images of the contract barrier were made which show microscopic imperfections such as phosphorus precipitates on the interface as well as microscratches. In the area of transition metal oxides, progress was made in understanding the mechanism of switching found in thin films of Nb2O5. In another area, involving structural instabilities of thin glass films, it was identified that a small phosphorus impurity is able to recrystallize SiO2 at the relatively low temperature of 525C. Phosphorus is commonly used to dope the SiO2 used in MOS transistors. Also, a destructive interface reaction between SiO2 and vanadium was found. (Modified author abstract)

AD-768 980/5GA PC$3.50/MF$1.45
Stanford Univ Calif Microwave Lab
THE TRAVELING SPACE CHARGE WAVE GAAS AMPLIFIER.
Final rept. 6 Apr 72-5 Apr 73,
G. S. Kino, P. Antognetti, G. R. Bisio, and S. Kofol. Aug 73, 53p RADC-TR-73-228
Contract F30602-72-C-0269

Descriptors: (*Semiconductor devices, Microwave amplifiers), (*Microwave amplifiers, *Gallium arsenides), Design, Space charges, X band, Semiconducting films, Gates(Circuits), Manufacturing methods.
Identifiers: Schottky barriers, Traveling waves.

At the start of the program a batch of amplifiers was made of Stanford material. These amplifiers oscillated because the semiconductor layer was too thick. A new design with Schottky-barrier input and output gates was made, however, no useful experimental results were obtained because of the difficulties in obtaining the necessary high quality material. A new theoretical analysis to predict the input and output impedances of the device was carried out. The conclusion is that it is possible to make a low noise amplifier by operating the input region in the positive differential mobility range. By using a Schottky-barrier at the input, it is possible to control the dc field distribution along the device, and to work with an input impedance in the order of 50 ohms. The output efficiency will be poor unless the devices are made very short with a large gain per unit length, and a short output gap less than half a wavelength long at the saturation velocity of the carriers. (Author)

BDX-613-662/GA PC$3.50/MF$1.45
Bendix Corp., Kansas City, Mo.
ELECTRICAL TERMINATIONS: WELDED, BRAZED, AND BONDED, FY72-3. QUARTERLY REPORT.
D. E. Stittsworth. Mar 73, 29p
Contract AT(29-1)-613

Descriptors: (*Arc welding, *Research programs), (*Connectors, *Joints), (*Electric contacts, Joints), (*Printed circuits, Joints), Brazing, Copper, Nickel, Welded joints, Wires.

For abstract, see NSA 28 07, number 17712.

COM-73-11797/0GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
LIGHT EMITTING DIODES. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1968-Sep 73,
Edward J. Lehmann. Oct 73, 115p* NTIS-WIN-73-074
Supersedes NTIS-PK-130.

Descriptors: (*Diodes(Semiconductor), *Electroluminescence), (*Photodiodes, Bibliographies), Lasers, Viewing screens, Display systems, Thin films, Semiconducting films, Gallium arsenides, Semiconductor devices.
Identifiers: *Light emitting diodes, *Semiconductor lasers, Solid state lasers, Electroluminescent diodes.

The NTISearch Bibliography contains 110 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The topics include studies on electroluminescent and semiconductor laser diodes and cover their theory, design, application, and materials studies. (Author)

LA-5292-MS/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
ENERGY LOSS IN SUPERCONDUCTING MAGNETIC ENERGY STORAGE COILS.
D. M. Weldon. May 73, 13p

Descriptors: (*Superconducting magnets, *Energy losses), Energy storage, Hysteresis, Magnet coils, Thermonuclear devices.

For abstract, see NSA 28 07, number 17220.

LA-5304-MS/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
CYLINDRICAL POINT COILS FOR MAGNETIC FIELD MAPPING.
M. D. Thomason. Jun 73, 6p
Contract W-7405-eng-36

Descriptors: (*Magnetic fields, *Magnetic probes), Cylindrical configuration, Magnet coils.

For abstract, see NSA 28 07, number 17773.

LA-tr-73-13/GA PC$3.00/MF$1.45
COIL CHARACTERISTICS OF WIRE WITH EXTREMELY THIN TWISTED CORE STRINGS.
C. Ikeda, Y. Furuto, I. Inoue, and T. Suzuki. 3p
Translation of Kyokusai Tashin Tsuisuto Sen no Koiru Tokusei.

Descriptors: (*Superconductors, *Magnet coils), (*Superconducting magnets, Magnet coils), Configuration, Filaments, Magnetic fields, Magnets, Wires.

For abstract, see NSA 28 08, number 19768.

LA-tr-73-14/GA PC$4.00/MF$1.45
ON CONNECTION CURRENT OF COMPOSITE SUPER CONDUCTIVE WIRE.
Y. Furuto, C. Ikeda, S. Meguro, and I. Inoue. 4p
Translated from pp 266 of Conference of the Institute of Electrical Engineers of Japan, 1973.

Descriptors: (*Superconductors, *Electric currents), Filaments, Geometry, Wires.

For abstract, see NSA 28 08, number 19769.

LA-tr-73-15/GA PC$3.00/MF$1.45
PRODUCTION OF V SUB 3 GA SUPER CONDUCTIVE MAGNET (I).
Y. Furuto, C. Ikeda, Y. Tanaki, T. Suzuki, and S. I. Meguro. 3p
Translation of V Ga Choadendo Magunetto no Shisaku (1).

Descriptors: (*Superconducting magnets, *Performance testing), (*Magnets, *Superconductors), Gallium alloys, Magnet coils, Vanadium base alloys, Wires.

For abstract, see NSA 28 08, number 19770.

N-73-17215/GA PC$4.00/MF$1.45
Jet Propulsion Lab., Pasadena, Calif.
RADIATION EFFECTS ON THREE LOW-POWER MICROCIRCUITS.
K. A. Yamakawa. 15 Nov 72, 30p NASA-CR-130750, JPL-TM-33-576
Contract NAS7-100

Descriptors: (*Electronic circuits, *Physical radiation effects), (*Mosfet, Physical radiation effects), (*Logic circuits, Physical radiation effects), Cobalt 60, Electrons, Gamma radiation, Neutrons.

For abstract, see NSA 28 08, number 18379.

N-73-18759/GA PC$4.00/MF$1.45
Gulf General Atomic CO., San Diego, Calif.
DEVELOPMENT OF CHEMICALLY VAPOR DEPOSITED RHENIUM EMITTERS OF (0001) PREFERRED CRYSTAL ORIENTATION.
L. Yang, and R. G. Hudson. 19 Feb 73, 47p NASA-CR-121143, GULF-GA-A-12506
Contract NAS3-15323

Descriptors: (*Rhenium, *Chemical preparation), (*Rhenium chlorides, *Pyrolysis), (*Thermionic emission, Rhenium), Deposition, Impurities, Microstructure, Orientation, Work functions.

For abstract, see NSA 28 08, number 18730.

N73-30189/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration.
Lewis Research Center, Cleveland, Ohio.
HOLLOW CATHODES WITH BAO IMPREGNATED, POROUS TUNGSTEN INSERTS AND TIPS.
W. R. Hudson, and A. J. Weigand. 1973, 20p
NASA-TM-X-71417, E-7652
Conf-Proposed for Presentation at 10TH Elec. Propulsion Conf., Lake Tahoe, Nev., 31 Oct - 2 Nov. 1973; Sponsored by Aiaa.

Descriptors: *Barium oxides, *Hollow cathodes, *Porous materials, *Thermionic cathodes, Inserts, Klystrons, Magnetrons, Tungsten.

For abstract, see STAR 1121

N73-30190/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration.
Goddard Space Flight Center, Greenbelt, Md.
EXPERIMENT FOR DETERMINATION OF ELECTROLUMINESCENT DIODE/DIODE MOUNT THERMAL CHARACTERISTICS.
M. Tycz. Jul 73, 7p NASA-TM-X-70440, X-524-73-219
Subm-Submitted for Publication.

Descriptors: *Diodes, *Electroluminescence, *Thermodynamic properties, Gallium arsenides, Light emission, Temperature, Test facilities.

For abstract, see STAR 1121

N73-30191/3GA PC$5.50/MF$1.45
General Electric Co., Schenectady, N.Y. Microwave Tube Operation.
SELF-HEALING FUSE DEVELOPMENT.
Final Report.
N. D. Jones, R. E. Kinsinger, and L. P. Harris. 30 Jan 73, 66p NASA-CR-121244
Contract NAS3-14388

Descriptors: *Circuit breakers, *Electric fuses, *Product development, Aluminum oxides, Beryllium oxides, Electrical insulation, Failure analysis, Life (Durability), Mercury (Metal), Overvoltage.

For abstract, see STAR 1121

N73-30716/7GA PC$3.00/MF$1.45
Communications Research Centre, Ottawa (Ontario).
THE EFFECT OF LASER-INDUCED THERMAL PULSES ON THE THRESHOLD VOLTAGE OF MOSFETS.
R. H. Hum, and A. L. Barry. Jun 73, 8p CRC-1246

Descriptors: *Field effect transistors, *Laser heating, *Metal oxide semiconductors, *Threshold currents, Failure analysis, Gates (Circuits), Irradiation, Ruby lasers.

For abstract, see STAR 1121

N73-31096/3GA PC$3.25/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
PROPERTIES OF WAVEGUIDE COUPLING ELEMENTS EIGENSCHAFTEN VON HOHLKABEL - VERBINDUNGSELEMENTEN.
A. Traeger, and B. Fehn. Oct 72, 24p FTZ-A-333-TBR-18
Language in German.

Descriptors: *Attenuation, *Beam waveguides, *Bending moments, *Microwave coupling, Curvature, Extremely high frequencies, Tensile properties.

For abstract, see STAR 1122

N73-31171/4GA PC$10.00/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
MULTIBEAM ANTENNA STUDY, PHASE 2.
Final Report.
P. J. Byrnes. 2 Jul 73, 160p NASA-CR-132793, LMSC-D346314
Contract NAS5-21711

Descriptors: *Dielectrics, *Lens design, *Multiple beam interval scanners, *Waveguide antennas, Beams (Radiation), Computerized simulation, Parallel plates, Ray tracing.

For abstract, see STAR 1122

N73-31172/2GA PC$6.50/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
AVALANCHE DIODES FOR THE GENERATION OF COHERENT RADIATION.
Final Status Report, 16 Aug. 1972 - 28 Feb. 1973.
P. Penfield, Jr.. 30 May 73, 90p NASA-CR-132300
Contract NGL-22-009-337

Descriptors: *Avalanche diodes, *Microwave amplifiers, *Microwave oscillators, *Solid state devices, Acoustic measurements, Electrodynamics, Structural design.

For abstract, see STAR 1122

N73-31174/8GA PC$3.75/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
HIGHER ORDER FREQUENCY MULTIPLICATION USING STEP-RECOVERY DIODES FREQUENZVERVIELFACHUNG HOHER ORDNUNG MIT LOESCHSPRUNGDIODEN (STEP-RECOVERY-DIODEN).
K. Doering. Sep 72, 34p FTZ-A-46-TBR-5
Language in German.

Descriptors: *Frequency multipliers, *Junction diodes, *Microwave oscillators, Efficiency, Electron recombination, Idlers, Minority carriers, Nonlinearity, Pulse generators, Step functions.

For abstract, see STAR 1122

N73-31175/5GA PC$3.00/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
GAS SUPPLY SYSTEM FOR A 3 BY 3 KM WAVEGUIDE TEST SECTION GASBESCHICKUNGSANLAGE FUER EINE 3 X 3 KM-HOHLKABELVERSUCHSSTRECKE.
W. Vorwerk. Mar 72, 19p FTZ-A-333-TBR-10
In German; English Summary.

Descriptors: *Attenuation, *Beam waveguides, *Extremely high frequencies, *Water vapor, Filling, Millimeter waves, Nitrogen, Oxygen, Pipes (Tubes), Polyvinyl chloride.

For abstract, see STAR 1122

N73-31180/5GA PC$3.50/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
MEASUREMENT OF THE CHARACTERISTIC PARAMETERS OF STEP RECOVERY DIODES MESSUNG DER CHARAKTERISTISCHEN PARAMETER VON STEP-RECOVERY-DIODEN (LOESCHSPRUNGDIODEN).
K. Doering. Feb 72, 30p FTZ-A-651-TBF-3
Language in German.

Descriptors: *Diodes, *Microwave equipment, *Minority carriers, *Pulse generators, *Switching, Life (Durability), Step functions, Time.

For abstract, see STAR 1122

N73-31181/3GA PC$4.50/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
ATTENUATION CALCULATIONS OF CIRCULARLY BENT WAVEGUIDES WITH DIELECTRIC COATINGS DAEMPFUNGSBERECHNUNGEN AN KREISFOERMIG GEKRUEMMTEN DIELEKTRISCH BESCHICHTETEN HOHLKABELN.
G. Garlichs. Nov 72, 50p FTZ-A333-TBR-16
In German; English Summary.

Descriptors: *Beam waveguides, *Coatings, *Wave attenuation, *Waveguide filters, Bending, Coupled modes, Curvature, Dielectrics, Propagation modes, Wave propagation.

For abstract, see STAR 1122

N73-31182/1GA PC$4.75/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
ATTENUATION MEASUREMENTS OF HELICAL WAVEGUIDES IN THE 30 TO 70 GHZ FREQUENCY RANGE DAEMPFUNGSMESSUNGEN AN WENDELHOHLKABELN IM FREQUENZBEREICH 30 BIS 70 GHZ.
H. Richter. Nov 72, 54p FTZ-333-TBR-17
In German; English Summary.

Descriptors: *Backward wave tubes, *Beam waveguides, *Frequency shift keying, *Wave attenuation, Curvature, Extremely high frequencies, Helical windings, Measuring instruments.

For abstract, see STAR 1122

N73-31184/7GA PC$3.25/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany). Inst. fuer Satellitenelektronik.
ON THE FAILURE ANALYSIS OF ELECTRONIC SEMICONDUCTOR ELEMENTS, ESPECIALLY BY MEANS OF METALLOGRAPHY.
R. Gohle. 4 Jul 72, 25p DLR-MITT-72-20
In German; English Summary.

Descriptors: *Failure analysis, *Metallography, *Semiconductor devices, Bonding, Chips, Crystal structure, Film thickness, Single crystals.

For abstract, see STAR 1122

N73-31185/4GA PC$5.00/MF$1.45
Laboratoire Central de Recherches Thomson-CSF, Orsay (France).
NONLINEAR AND PARAMETRIC EFFECTS IN ELECTRON TRANSFER OSCILLATORS ETUDE DES EFFETS NON LINEAIRES ET PARAMETRIQUES DANS LES OSCILLATEURS A TRANSFERT D'ELECTRONS RAPPORT FINAL.
Final Report.
F. Diamand. Mar 72, 56p
Contract DGRST-70-72-355
Misc-Original Contains Color Illustrations.
Language in French.

Descriptors: *Diodes, *Microwave oscillators, *Superhigh frequencies, *Synchronized oscillators, Cavity resonators, Dynamic characteristics, Electrical impedance, Gunn diodes, Negative resistance devices, Synchronism.

For abstract, see STAR 1122

N73-31205/0GA PC$3.00/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
SIMPLE INTEGRATED DIGITAL CIRCUIT WITH GUNN ELEMENTSEINE EINFACHE INTEGRIERTE DIGITALSCHALTUNG MIT GUNNELEMENTEN.
K. Mause. Feb 72, 13p FTZ-A-62-TBR-3
In German; English Summary.

Descriptors: *Gallium arsenides, *Gunn diodes, *Integrated circuits, *Pulse code modulation, Digital techniques, Domains, Electric dipoles, Schottky diodes.

For abstract, see STAR 1122

N73-31624/2GA PC$9.00/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
DESIGN PARAMETERS OF TOROIDAL AND BOBBIN MAGNETICS.
W. T. Mclyman. 15 Sep 73, 139p NASA-CR-133932, JPL-TM-33-651
Contract NAS7-100

Descriptors: *Electric coils, *Electrical measurement, *International system of units, Electrical engineering, Metrology, Units of measurement, Voltage regulators.

For abstract, see STAR 1122

N73-31659/8GA PC$3.75/MF$1.45
Technische Universitaet, Brunswick (West Germany). Inst. fuer Hochspannungstechnik.
LOSS REDUCTION AT LOW TEMPERATURES IN HIGH VOLTAGE OSCILLATION CIRCUITS.
D. Peier. Dec 72, 32p BMBW-FB-K-72-31
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
In German; English Summary.

Descriptors: *Cryogenics, *Lc circuits, *Oscillators, *Plasma physics, Equivalent circuits, High voltages, Q factors.

For abstract, see STAR 1122

PAT-APPL-174684/GA PC$3.50/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
STORED CHARGED DEVICE.
Patent Application.
J. Maserjian, and G. W. Lewicki. Filed 25 Aug 71, 28p NASA-CASE-NPO-11156-2,
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electrical insulation, *Electrical properties, *Energy storage, *Field effect transistors, Equipment specifications, Patent applications, Thin films.

The development of a stored charge device is discussed. A thin film metal layer is embedded between two insulating films used in a metal-nitride- oxide-silicon field effect transistor. The embedded metal layer provides a two-terminal, thin film, stored charge device which can be used in high density memory arrays. Drawings of the equipment and detiiled explanation of the operation are provided.

PAT-APPL-380468/GA PC$3.00/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
DEEP TRAP, LASER ACTIVATED IMAGE CONVERTING SYSTEM.
Patent Application.
J. Maserjian. Filed 22 Aug 73, 19p NASA-CASE-NPO-13131-1,
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Image converters, *Photoconductors, *Semiconductor devices, *Signals, *Video data, Lasers, Patent applications, Photon beams.

A system is disclosed for receiving an optical image on the surface of a photoconducting semiconductor, storing the image in deep traps of the device, and later scanning the semiconductor with a laser beam to empty the deep traps, thereby producing a video signal. The semiconductor is illuminated with photons of energy h nu greater than the band gap delta E producing electron-hole pairs in the semiconductor which subsequently fill traps of a depth delta E sub t in energy from the band edges. When the laser beam of low energy photons excites the trapped electrons and holes out of the traps into the conduction and valence bands, a photoconductivity can be observed.

PATENT-3 489 988/GA Not available NTIS
Department of the Navy Washington D C
IN-LINE CABLE CONNECTORS.
Patent,
Luason L. Carnaghan. Filed 22 Sep 67, patented 13 Jan 70, 5p Rept nos. PAT-APPL-669 960,

Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Electric connectors, *Patents), Coaxial cables, Electric wire, Integrated systems.
Identifiers: PAT-CL-339-60.

The patent describes an electrical cable connector for connecting coaxial to coaxial cable, coaxial to single-conductor cable, or single-conductor to single-conductor cable. The connector comprises five basic components; two cable terminations; means such as male and female contact pins for establishing electrical contact between the center conductors of the cables; a cylindrical main body enclosing the electrical contact means and partially enclosing and being screwed to the cable terminations; and waterproofing means such as O-rings. The O-rings are placed between the cable terminations and the main body and also between the cable terminations and the dielectric layer of the cable so that water cannot come inside the connector to make contact with the center conductor contact means. The largest outer diameter is no larger than the outer diameter of the cables so that the connector appears to be a portion of the cable itself as far as size is concerned.

PATENT-3 513 332/GA Not available NTIS
Department of the Navy Washington D C
POLYPHASE POWER INTERRUPTION APPARATUS INCLUDING BIDIRECTIONAL SEMICONDUCTORS.
Patent,
Franklin B. Snyder. Filed 27 Jul 67, patented 19 May 70, 5p Rept nos. PAT-APPL-656 630,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Interrupters, *Patents), Semiconductor devices, Electronic switches, Trigger circuits, Test equipment(Electronics).
Identifiers: PAT-CL-307-252.

The patent describes a three-phase power interruption apparatus which includes a controllable bidirectional semiconductor interposed in each respective phase between a source of power and a load. Each of the semiconductors is controlled by a respective trigger voltage supply which is connected to receive a voltage from the source having a relatively leading phase. An oscillator driven counter and associated relay circuitry causes the trigger supplies to cease providing the trigger voltage for a predetermined interval so that the semiconductors correspondingly interrupt the provision of power to the load during that interval.

PATENT-3 700 939/GA Not available NTIS
Department of the Navy Washington D C
FERROELECTRIC CERAMIC STACK.
Patent,
Frank R. Abbott. Filed 10 Sep 71, patented 24 Oct 72, 4p Rept nos. PAT-APPL-179 347,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Electroacoustic transducers, *Patents), Ferroelectric crystals, Electric connectors, Springs.
Identifiers: PAT-CL-310-9-8.

The patent describes a unique coupling arrangement for joining the thin leaf conductors interposed between adjacent ones of a stack of ferroelectric elements functioning as an acoustic energy projecting transducer. A separate resilient helical spring element is secured to each metallic conductor and has an orthogonally shaped portion to slidably contact one of two longitudinally extending bus bars sized to reach through the orthogonal portions. By coupling alternate ones of the helical springs to one of the bus bars and the other alternate ones of the helical springs to the other bus bar, the ferroelectric rings are connected electrically in parallel to provide an additive composite driving force for the transducer when a suitable driving field is impressed across the stack.

PATENT-3 700 945/GA Not available NTIS
Department of the Navy Washington D C
HIGH POWER PULSED ELECTRON BEAM.
Patent,
Mushe Friedman, and Michael G. Ury. Filed 30 Aug 71, patented 24 Oct 72, 4p Rept nos. PAT-APPL-175 888,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Electron beams, *Patents), Cathodes(Electron tubes), Field emission, Magnetic fields.
Identifiers: PAT-CL-313-84.

The patent describes an apparatus for generating a relativistic annular electron beam with a power in the 10 to the 10th power watt range using a solid conical cathode of blunted shape and a surrounding truncated anode. A high intensity, pulsed magnetic field guides and focuses the electrons emitted from roughened areas of the cathode by a cold field emission process to form the annular beam.

PATENT-3 701 057/GA Not available NTIS
Department of the Navy Washington D C
BROAD-BAND LUMPED-ELEMENT DIRECTIONAL COUPLER.
Patent,
Cletus A. Hoer. Filed 20 May 71, patented 24 Oct 72, 7p Rept nos. PAT-APPL-145 153,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Waveguide couplers, *Patents), Transmission lines, Broadband, Coupling circuits.
Identifiers: *Directional couplers, PAT-CL-333-10.

The patent describes a broad-band lumped element directional coupler for measuring either the forward or reflected power in a coaxial transmission line. A resistive voltage divider is coupled to the center conductor of a transmission line with a capacitor to keep the phase of the voltage sampling circuit equal to the phase of the current sampling circuit. Capacitors shunting the resistors make the voltage ratio of the resistive voltage divider independent of frequency over a large frequency range. Directivity greater than 50 dB is achieved over a large frequency range for coupling ratios of 30, 40 and 50 dB.

PATENT-3 745 352/GA Not available NTIS
Boeing Co., Seattle, Wash.
RADIATION SENSITIVE SOLID STATE SWITCH.
Patent.
R. J. Hutto. Patented 10 Jul 73, 7p NASA-CASE-NPO-10817-1,
Misc-Filed 21 Oct. 1970 Supersedes N72-13206 (10 - 04, p 0459). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Solid state devices, *Switching circuits, Disks (Shapes), Interruption, Patents, Radiation sources.

A mechanically operable solid state switch suited for use in achieving a variable circuit-switching function is described. This switch is characterized by an annular array of photoresponsive switching devices, disposed in communication with an included source of radiation, and a plurality of interchangeable, mechanically operable interrupter disks. Each disk has a predetermined pattern of transparent and opaque portions. Operative displacement of each disk serves to make and break selected electrical circuits through the photo responsive devices of said array.

PATENT-3 745 410/GA Not available NTIS
General Dynamics Corp., San Diego, Calif.
DRIVING LAMPS BY INDUCTION.
Patent.
H. H. Laue, and L. G. Clough. Patented 10 Jul 73, 4p NASA-CASE-MFS-21214-1,
Misc-Filed 16 Mar. 1972 Supersedes N72-21252 (10 - 12, p 1587). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Circuits, *Luminaires, Krypton, Mercury (Metal), Patents, Radio frequencies.

An electrodeless lamp circuit with a coil surrounding a krypton lamp is driven by an RF input source. A coil surrounding a mercury lamp is tapped across the connection of the input central to the krypton-lamp coil. Each coil is connected in parallel with separate capacitors which form resonant circuits at the input frequency.

SC-CR-69-3104/GA PC$4.50/MF$1.45
Sprague Electric CO., North Adams, Mass.
DEVELOPMENT OF NEW DIELECTRIC SYSTEMS TO PROVIDE A MINIMUM VOLUMETRIC EFFICIENCY OF TEN JOULES PER CUBIC INCH. FINAL REPORT, NOVEMBER 8, 1968--FEBRUARY 9, 1969.
4 Mar 69, 49p

Descriptors: (*Capacitors, *Dielectric materials), (*Energy storage, Dielectric materials), Ceramics, Efficiency, Glass, Polymers.

For abstract, see NSA 28 08, number 20639.

SLA-73-5336/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
TRANSIENT CHANGE IN Q AND FREQUENCY OF AT-CUT QUARTZ RESONATORS FOLLOWING EXPOSURE TO PULSE X-RAYS.
J. C. King, and H. H. Sander. 1973, 12p CONF-730703-7

Descriptors: (*Oscillators, *Physical radiation effects), (*Quartz, Physical radiation effects), Electric conductivity, Frequency dependence, Pulsed irradiation, Temperature dependence, Transients, X radiation.

For abstract, see NSA 28 08, number 18380.

SLA-73-535/GA PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
FACTORS THAT AFFECT THE SOLID-PHASE BONDING OF GOLD WIRE ELECTRICAL LEADS.
R. E. Cuthrell, and D. W. Tipping. May 73, 24p

Descriptors: (*Gold, *Bonding), (*Tungsten, Bonding), (*Electric contacts, *Wires), Electronic circuits, Fracture properties, Sputtering.

For abstract, see NSA 28 07, number 17806.

SLA-73-5613/GA PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
LATCH-UP IN CMOS INTEGRATED CIRCUITS.
B. L. Gregory, and B. D. Shafer. Jul 73, 21p CONF-730703-8

Descriptors: (*Mos transistors, *Radiation hardening), (*Integrated circuits, Radiation hardening), Physical radiation effects.

For abstract, see NSA 28 08, number 18381.

SLA-73-5617/GA PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
EXPERIMENTAL NEUTRON DAMAGE EQUIVALENCES UTILIZING DEVICE PARAMETERS.
F. N. Coppage. 1973, 21p CONF-730703-5

Descriptors: (*Transistors, *Physical radiation effects), Neutrons, Silicon.

For abstract, see NSA 28 07, number 15640.

SLA-73-5618/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
ROOM TEMPERATURE ANNEALING OF IONIZATION-INDUCED DAMAGE IN CMOS CIRCUITS.
D. H. Habing, and B. D. Shafer. Jul 73, 19p
CONF-730703-6

Descriptors: (*Mos transistors, *Annealing), (*Logic circuits, Annealing), Electrons, Gamma radiation, Medium temperature, Physical radiation effects.

For abstract, see NSA 28 07, number 15641.

SLA-73-5631/GA PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
RADIATION FAILURE MODES IN CMOS INTEGRATED CIRCUITS.
R. A. Burghard, and C. W. Gwyn. Jul 73, 30p
CONF-730703-4

Descriptors: (*Mos transistors, *Physical radiation effects), (*Logic circuits, Physical radiation effects), Cobalt 60, Gamma radiation, Integrated circuits.

For abstract, see NSA 28 07, number 15642.

UCRL-51397/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
CODE FOR VIEWING MAFCO CONDUCTORS FROM ANY ANGLE.
T. N. Haratani, and R. W. Moir. 15 Jun 73, 14p
Contract W-7405-eng-48
U.S. Sales Only.

Descriptors: (*Electric conductors, *Inspection), (*Computer codes, *M codes), Magnetic fields, Rotation.

For abstract, see NSA 28 08, number 20593.

9B. Computers

AAEC/E-248/GA PC$3.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
MACROS TO SIMULATE FORTRAN I/O IN ASSEMBLER PROGRAMS.
S. Johnson. Dec 72, 11p
U.S. Sales Only.

Descriptors: (*Programming, *Fortran), (*Ibm computers, Programming), Programming languages.

For abstract, see NSA 28 08, number 20558.

AAEC/E-251/GA PC$3.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
AESYNTAX: A FORTRAN SYNTAX ANALYSIS SYSTEM FOR THE PDP9L.
J. M. Barry. Dec 72, 12p
U.S. Sales Only.

Descriptors: (*Fortran, *Programming), Pdp computers.

For abstract, see NSA 28 08, number 20559.

AAEC/TM-623/GA PC$3.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
PDPCOPY: AN INTERACTIVE PDP9L TAPE TRANSLATION AND ANALYSIS PROGRAM.
R. P. Backstrom. Nov 72, 13p
U.S. Sales Only.

Descriptors: (*Magnetic tapes, *Ibm computers), (*Data processing, Magnetic tapes), (*Computer codes, *P codes), Pdp computers, Programming languages.

For abstract, see NSA 28 08, number 20560.

AAEC/TM-633/GA PC$3.00/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
AAEARITH: MULTIPLE PRECISION ARITHMETIC ROUTINES FOR THE IBM360 FORTRAN USER.
R. P. Backstrom. Nov 72, 11p
U.S. Sales Only.

Descriptors: (*Computer codes, *A codes), (*Mathematics, Computer codes), Fortran, Ibm computers, Polynomials, Programming languages.

For abstract, see NSA 28 08, number 20561.

AD-768 402/0GA PC$3.25/MF$1.45
Southeastern Massachusetts Univ North Dartmouth
ON THE COMPLEXITY AND RECOGNITION RATES IN FEATURE SELECTION.
Technical rept.,
Chi-Hau Chen. Jul 73, 23p Rept no. TR-7 AFOSR-TR-73-1905
Grant AF-AFOSR-2119-71
Presented at the International Joint Conference on Pattern Recognition (1st) Washington, D.C. 30 Oct-1 Nov 73.

Descriptors: (*Pattern recognition, Seismic waves), (*Seismic waves, Classification), Information theory, Stochastic processes, Graphics, Set theory, Algorithms.
Identifiers: Feature selection, Feature extraction, Computational complexity, Markov processes, *Seismic discrimination.

For any pattern recognition problem, it is necessary to consider a meaningful constraint on the computational complexity. This is particularly true in selecting the optimum feature subset. Here complexity includes both the computation time and the memory space. Of course, the recognition rate, i.e. the probability of correct recognition, is another constraint which must simultaneously be taken into account. As the recognition rate reaches certain level, further improvement may require excessive amount of computational complexity. Thus for any specific application, there must be a trade-off between the two factors. Exhaustive search for the optimum feature subset is not practical. Sequential recursive procedure is shown to provide the best compromise in complexity and recognition rate for the construction of the best feature subset. Recognition rates for feature subsets selected by Bhattacharyya distance, mutual information and direct error probability estimation are also compared. With both the complexity and recognition rates in mind, simple and effective feature are extracted from the ACDA seismic data for realtime seismic discrimination. (Modified author abstract)

AD-768 417/8GA PC$2.75/MF$1.45
Bolt Beranek and Newman Inc Cambridge Mass
INTERFACE MESSAGE PROCESSORS FOR THE ARPA COMPUTER NETWORK.
Quarterly technical rept. no. 3, 1 Jul-30 Sep 73,
Frank E. Heart. Oct 73, 25p Rept no. BBN-2667
Contract F08606-73-C-0027
See also report dated Jul 73, AD-763 734.

Descriptors: (*Data processing systems, Networks), (*Digital computers, Data transmission systems), Interfaces, Remote control systems, Algorithms.
Identifiers: IMP(Interface Message Processors), *Interface message processors, *Computer networks, ARPA computer network, Data processing terminals, Teleprocessing.

The ARPA computer network provides a communication medium which allows dissimilar computers (Hosts) to interchange information. Each Host is connected to an Interface Message Processor (IMP), and IMPs are interconnected by leased common carrier circuits. There is frequently no direct circuit between two communicating Hosts, and the intermediate IMPs store and forward the information. IMPs regularly exchange information which is used to adapt routing to changing network conditions. IMPs also report a variety of parameters to a Network Control Center, which coordinates diagnosis and repair of malfunctions. The Terminal IMP (TIP) permits the direct attachment of 63 character-oriented terminals. The Satellite IMP (SIMP) will allow multi-station use of a single earth satellite channel. A High Speed Modular IMP (HSMIMP) is under development; one goal of this effort is to increase IMP performance by an order of magnitude. Specialized mini-Hosts under development will provide for: connection of remote batch terminals; simulation of a leased point-to-point circuit; encrypted Host communication. (Author)

AD-768 423/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CERTAIN ALGORITHMS OF ORGANIZATION OF COMPUTER MEMORY DISTRIBUTION,
M. G. Tsuladze. 1 Oct 73, 19p Rept no. FTD-HT-23-58-74
Edited trans. of Vychislitelnyi Tsentr, Erevan. Trudy (USSR) v10 n1 p58-72 1970, by Victor Mesenzeff.

Descriptors: (*Programming(Computers), Algorithms), Mathematical logic, Computer storage devices, Control sequences, USSR.
Identifiers: Translations.

AD-768 425/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
DEVICE FOR THE INPUT AND OUTPUT OF IMAGES FOR A DIGITAL COMPUTER,
G. K. Goranskii, E. V. Dneprovskii, and O. A. Vildflush. 10 Oct 73, 12p Rept no. FTD-HT-23-508-74
Edited trans. of Patent (USSR) 341 057 pl-4, 5 Jun 72, by Charles T. Ostertag, Jr.

Descriptors: (*Input-output devices, Digital computers), Images, Pattern recognition, Patents, USSR.
Identifiers: Translations, Image processing.

The invention pertains to the area of computer technology and can be used in devices for the input and output of images for digital computers.

AD-768 452/5GA PC$4.75/MF$1.45
Pattern Analysis and Recognition Corp Rome N Y
SYSTEM EXECUTIVE FOR ADVANCED OLPARS.
Final rept.,
David B. Connell, Robert J. McGrath, and Gerald T. Stevens. Aug 73, 165p Rept no. PAR-73-16
RADC-TR-73-241
Contract F30602-72-C-0519

Descriptors: (*Programming(Computers), Instruction manuals), Data processing systems, Pattern recognition.
Identifiers: OLPARS(On Line Pattern Analysis and Recognition System), On line pattern analysis and recognition system, HIS 645 computer, MUL-

TICS system, MOOS operating system, *Operating systems(Computers), Programming manuals, FORTRAN, On line systems.

The report describes the initial system design and implementation of the executive and filing system software for an Advanced version of the On-Line Pattern Analysis and Recognition System (OLPARS) on the HIS 645 computer using the MULTICS operating system. The MULTICS/OLPARS Operating System (MOOS) permits multi-user access to system algorithms in a far less restrictive manner than the 1604B version of OLPARS. The current contract has been devoted to extensive system design and only limited program implementation due to (a) the minimal availability of MULTICS compiler usage, and (b) the lack of a system display console. In the long run, emphasis upon a detailed basic system design will prove to be beneficial in terms of system modification and addition to system capabilities. Nevertheless, no system display programming was possible as mentioned above and this may necessitate further system design during initial display implementation. All possible precautions have been taken to minimize any ruther design effort. (Author)

AD-768 461/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
DIGITAL COMPUTER MODELING OF THE PROCESS OF AUTOMATION OF SCANNING OF THREE-DIMENSIONAL OBJECTS FOR THEIR IDENTIFICATION,
V. K. Zlobin, N. V. Zlobina, and V. D. Kurganov.
11 Oct 73, 15p Rept no. FTD-HT-23-64-74
Edited trans. of Mashinostroenie (USSR) v10 p221-228 1972, by Charles T. Ostertag, Jr.

Descriptors: (*Pattern recognition, Algorithms), Digital computers, Scanning, Programming(Computers), USSR, Automation.
Identifiers: Translations.

AD-768 513/4GA Reprint
Hawaii Univ Honolulu Dept of Physics and Astronomy
FAST-CONVERGING ADAPTIVE ALGORITHMS FOR WELL-BALANCED SEPARATING LINEAR CLASSIFIER,
Tsuguchika Kaminuma, and Satosi Watanabe. 4 Oct 71, 20p AFOSR-TR-73-1803
Grant AF-AFOSR-1466-68
Availability: Pub. in the Jnl. of Pattern Recognition, v4 p289-305 1972.

Descriptors: (*Pattern recognition, Algorithms), Classification, Decision theory, Graphics, Programming(Computers), Adaptive systems.

The perceptron-adaline-type adaptive linear decision function converges, in a separable case, to a separating hyperplane, but its location depends on the initial trial function, the order of presentation of paradigms (class samples) and the parameters involved and is often ill-balanced with reference to the distribution of the paradigms of the two classes. The Widrow-Hoff-type least-mean-error algorithm does not necessarily give a separating hyperplane even in a separable case, and is often too sensitive to the shapes of the clusters of paradigms. The adaptive approximation to this least-mean-error hyperplane converges extremely slowly. The authors propose various adaptive algorithms which converge rapidly to a separating hyperplane whose location is well-balanced with regard (1) to the distances of the entroids of the clusters from the plane and (2) to the direction of the plane relative to the line connecting the two centroids. This method shows also an excellent separation in the linearly-non-separable, quadratically-separable case,

AD-768 675/1GA Reprint
California Univ Los Angeles Calif Dept of Computer Science
ASSOCIATIVE MEMORIES AND PROCESSORS: AN OVERVIEW AND SELECTED BIBLIOGRAPHY,
Behrooz Parhami. 19 Jan 73, 10p
Contracts N00014-69-A-0200-4027, AT(11-1)-GEN-10
Sponsored in part by Grant NSF-GJ-33007. Revision of report dated 21 Jul 72.
Availability: Pub. in Proceedings of the IEEE, v61 n6 p722-730 Jun 73.

Descriptors: (*Data processing systems, Reviews), (*Data storage systems, Reviews), Design, Multiple operation, Programming(Computers), Air traffic control systems, Information retrieval.
Identifiers: *Associative storage, *Associative processors, Computer systems hardware, Signal processing.

A survey of associative processing techniques is presented, together with a guide to the published literature in this field. Some familiarity with the basic concepts of associative processing is assumed. The references have been divided into four groups dealing with architectural concepts, hardware implementation, software considerations, and application areas. The application areas discussed include solution of some mathematical systems, radar signal processing, information storage and retrieval, and performance of certain control functions in computer systems. (Author)

AD-768 804/7GA PC$3.75/MF$1.45
Auburn Univ Ala Dept of Electrical Engineering
ON GENERATING NEAR MINIMUM TEST SETS.
Technical rept.,
John T. Ellis, and B. D. Carroll. 31 Aug 73, 88p
AROD-10372:3-RT
Grants DA-ARO-D-31-124-72-68G, DA-ARO-D-31-124-72-G147

Descriptors: (*Programming(Computers), Algorithms), (*Logic circuits, Test sets), Computer programs, Mathematical logic, Gates(Circuits), Instruction manuals.
Identifiers: Fault detection, PL/1 programming language, IBM 360/50 computers, Fault tolerant computing.

A computerized algorithm for generating near minimum test sets for fault detection in combinational logic circuits is presented. The advantages of the approach in this algorithm over classical techniques are shown. The algorithm is then described and illustrated in great detail. Two software implementations of the algorithm are also given. Finally, comparisons and contrasts between this algorithm and other similar ones are described. (Author)

AD-768 883/1GA PC$4.25/MF$1.45
Stanford Univ Calif Stanford Electronics Labs
THE EVALUATION OF MICROPROGRAM IMPLEMENTED EMULATORS.
Technical rept. no. 60,
Alan B. Salisbury. Jul 73, 116p* Rept no. SU-SEL-73-034
Contract N00014-67-A-0112-0044

Descriptors: (*Programming(Computers), Simulation), (*Digital computers, Selection), Data processing systems, Performance(Engineering), Coding, Mathematical models, Matrix algebra, Computer storage devices.
Identifiers: *Microprogramming.

A new technique for estimating the performance of microprogram implemented emulators is developed and presented. This technique of 'Synthetic Emulation' combines the concepts of mixes, kernel programs, synthetic programs and mathematical models, all adapted to the microprogramming environment. Methods are presented for the application of this technique to the problem of selecting host microprocessors for the emulation of one or more target machines in a known workload environment. The process of emulation is examined and target machine attributes which impact on emulation efficiency are presented. AVERAGE Instruction Emulation Rate, or Emulation Power, is presented as a criterion for the evaluation and selection of host microprocessors for the emulation of target machine CPU's. The applicability of each of the traditional techniques of performance evaluation and measurement ot microprogrammable processors is analyzed in some detail. (Modified author abstract)

AD-768 884/9GA PC$3.75/MF$1.45
Stanford Univ Calif Stanford Electronics Labs
A STUDY OF GENERAL-PURPOSE MICROPROGRAMMABLE COMPUTER ARCHITECTURES.
Technical rept. no. 59,
Alan B. Salisbury. Jul 73, 86p* Rept no. Su-SEL-73-033
Contract N00014-67-A-0112-0044

Descriptors: (*Digital computers, Design), Programming(Computers), Logic circuits.
Identifiers: *Microprogramming, Logic design, Programmable calculators, Dynamic programming.

Based on an extensive review of the literature, this report provides a comprehensive framework and descriptive parameters for the analysis of microprogrammable computer architectures. Separate discussions on hardware considerations, microprogramming considerations and control storage considerations are included. The emphasis is on identifying and analyzing those architectural features which provide flexibility and thus enhance the 'general-purpose' capabilities of microprogrammable processors. Introductory material traces the historical development of microprogramming from a technique of the computer designer to a tool of the systems and applications programmers. The concepts of 'firmware' and 'dynamic microprogramming' are also examined along with 'emulation' and the 'universal host' machine. (Author)

AD-768 885/6GA PC$3.25/MF$1.45
Stanford Univ Calif Stanford Electronics Labs
HAZARDS IN ASYNCHRONOUS SYSTEMS.
Technical rept.,
Donald R. Chewning, and Thomas H. Bredt. Sep 72, 24p Rept nos. SU-SEL-73-038, TR-52
Contract N00014-67-A-0112-0044
Sponsored in part by Joint Services Electronics Program.

Descriptors: (*Logic circuits, Synchronization(Electronics)), Mathematical logic, Gates(Circuits), Theorems, Modules(Electronics), Hazards.
Identifiers: *Asynchronous computers, *Combinational circuits.

Necessary and sufficient conditions are given for the existence of static and dynamic hazards in combinational circuits that undergo multiple input changes. These theorems are applied in the analysis of modules, such as the wye module, that have been proposed for asynchronous systems. The authors show that unless internal module delays are strictly less than delays between modules, incorrect operation can occur due to hazards in module implementations. (Author)

AD-768 886/4GA PC$5.25/MF$1.45
Stanford Univ Calif Stanford Electronics Labs
COST-EFFECTIVE PROCESSOR DESIGN WITH AN APPLICATION TO FAST FOURIER TRANSFORM COMPUTERS.
Technical rept. no. 73,
Arvid G. Larson. Aug 73, 184p Rept no. SU-SEL-73-037
Contract N00014-67-A-0112-0044, Grant NSF-GJ-35584

Descriptors: (*Data processing systems, Design), (*Logic circuits, Cost effectiveness), Digital computers, Performance(Engineering), Fourier analysis, Integral transforms, Computer programs.
Identifiers: Logic design, Fast Fourier Transform, Fourier transformation.

A cost-effective processor design is one that attains a high ratio of processing performance to processor component cost. This research investigates the circuit design of a processor or processing subsystems for costeffective implementation of a particular computation algorithm. The logic designs considered in this work use circuit components for which the delay and cost of functional building blocks or gates are known. A logic design technique is described that permits processing performance and cost comparisons among alternative computation algorithms and circuit technologies. It also provides a basis for contrasting alternative processor architectures, including both pipelined and parallel computing structures. (Modified author abstract)

AD-768 887/2GA PC$5.25/MF$1.45
Stanford Univ Calif Stanford Electronics Labs
DECOMPILATION OF OBJECT PROGRAMS.
Technical rept. no. 54,
Clifford R. Hollander. Jan 73, 191p Rept no. SU-SEL-73-029
Contract N00014-67-A-0112-0044, Grant NSF-GK-23315

Descriptors: (*Programming(Computers), Instruction manuals), Syntax, Semantics, Programming languages, Theses.
Identifiers: Translator routines, ALGOL, IBM 360/67 computers, FORTRAN, *Decompilers.

The thesis is concerned with the decompilation problem, in which a high-level language program is constructed that is a functionally equivalent image of a given machine-level language program. The name decompilation reflects the inverse role of this task to that of compilation. Portions of this document are not fully legible.

AD-768 896/3GA PC$3.00/MF$1.45
Stanford Univ Calif Digital Systems Lab
A SYNTAX-DIRECTED METHOD FOR OPERATING SYSTEM DESIGN.
Technical note,
Thomas H. Bredt. Dec 72, 20p Rept no. TN-29
Contract N00014-67-A-0112-0044, Grant NSF-GK-23315
Presented at Advanced Course on Computer Systems Architecture, sponsored by the European Common Market Community, 4-15 Dec 72 at L'Alpe d'Huez (France).

Descriptors: (*Computer programs, Design), Syntax, Control sequences.
Identifiers: *Operating systems(Computers).

It is proposed that an operating system be considered to be a collection of hardware and software translators. These translators accept as inputs messages in formally defined message languages. Among its outputs, a translator may produce output messages for input to other system translators. (Author)

AD-768 898/9GA PC$5.25/MF$1.45
Softech Inc Waltham Mass
MAIDS: INFORMATION DYNAMICS TECHNOLOGY REQUIREMENTS STUDY.
Final rept.,
John B. Goodenough, Douglas T. Ross, and R. Sterlin Eanes. Jun 73, 192p* FA-R-2078
Contract DAAA25-72-C-0667

Descriptors: (*Test equipment, *Programming(Computers)), (*Army equipment, Tests), Modules(Electronics), Reliability(Electronics), Compilers, Multiplex, Real time, Decision theory.
Identifiers: MAIDS system.

The report describes software technology problems concerning the use of automatic test equipment in the Army. It contains detailed analyses of three software technology areas: software modularity, software testing methods, and language processing technology. It also contains a description of a specially equipped software production facility - a 'software factory' - for producing test equipment programs. Current technology problems are identified in the form of 13 specific research and development efforts attacking these problems. These efforts fall into six research areas: modularity, reliability, portability, overlay analysis, compiler technology, and risk reduction. (Author)

AD-768 978/9GA PC$3.75/MF$1.45
Syracuse Univ N Y
ASSOCIATIVE COMPUTATIONS OF SOME MATHEMATICAL PROBLEMS,
Wei-tih Cheng, and Tse-Yun Feng. Aug 73, 85p
RADC-TR-73-229
Contract F30602-72-C-0281

Descriptors: (*Programming(Computers), Numerical analysis), Computer storage devices, Integral transforms, Fourier analysis, Partial differential equations, Matrix algebra, Logic circuits, Multiple operation, Search theory.
Identifiers: Associative storage, Fast Fourier transform, Fourier transformation, Arithmetic and logic units, Parallel processors, Associative processors, Computation.

Associative processing provides a natural combination of arithmetic-logic and search-retrieval capabilities which is a desired characteristic for many mathematical problems. In this report an associative processor which has a data manipulator as a separate functional unit for preparing operands is first described. In order to evaluate the effectiveness of such a system, a number of fundamental mathematical problems which are useful for a broad range of applications are studied. These are, among others, fast Fourier transform, partial differential equations, and matrix operations. New and modified algorithms are developed. Inefficient word-sequential loading and processing are minimized and redundant storage is eliminated. The execution times for solving these mathematical problems under various conditions are computed, analyzed, and compared with those required by two other associative organizations. It is shown that with the simplest arithmetic-logic units and bis (bit-slice)-sequential data manipulating capability assumed in the proposed organization, the improvements in system performance and storage requirements are significantly and consistently better than those of existing techniques. (Modified author abstract)

AD-768 979/7GA PC$5.75/MF$1.45
Space and Missile Systems Organization Los Angeles Calif
INFORMATION PROCESSING/DATA AUTOMATION IMPLICATIONS OF AIR FORCE COMMAND AND CONTROL REQUIREMENTS IN THE 1980S (CCIP-85). VOLUME X, CURRENT R AND D (REVISED).
Oct 73, 75p Rept no. SAMSO/XRS-71-1R
See also AD-742 292.

Descriptors: (*Command + control systems, *Data processing systems), (*Air Force, Command + control systems), Advanced planning, Automation, Communication equipment, Information theory, Military requirements.

The volume of the CCIP-85 study surveys current and projected technology programs in information processing, both hardware and saftware, to establish a base line concerning a deficiency analysis of the current programs to meet the CCIP-85 technology requirements. (Author)

AD-768 986/2GA PC$4.25/MF$1.45
Stanford Research Inst Menlo Park Calif
CDEC INSTRUMENTATION STUDY -- PHASE II,
J. H. Jones, W. Lynch, H. Frohbach, R. Madvig, and E. Elpel. Mar 60, 45p
Contract DA-04-351-AVI-1731
See also Phase 1, AD-768 961.

Descriptors: (*Data processing systems, Government procurement), Costs, Display systems, Programming(Computers), Budgets, Decision making.
Identifiers: Central processing units.

The contents of the report are primarily recommendations for future work and for allocation of funds for procurement or rental of data processing systems.

AD-769 004/3GA PC$2.75/MF$1.45
Maryland Univ College Park Computer Science Center
A HIERARCHICAL MACHINE MODEL FOR THE SEMANTICS OF PROGRAMMING LANGUAGES,
Victor R. Basili, and Albert J. Turner. 7 Nov 73, 16p
Contract N00014-67-A-0239-0021

Descriptors: (*Programming languages, Semantics), Syntax.
Identifiers: SIMPL X programming language.

An operational semantic model HGL (Hierarchical Graph Language) for programming languages is defined. HGL is a hierarchical system which permits a relatively modular breakup of the language structures and a variety of levels of description within the given modules. As an illustration, the programming language SIMPL-X is modeled in HGL. Special emphasis is placed on the control structure required for the language. (Author)

ANL/ESP-2/GA PC$3.75/MF$1.45
Argonne National Lab., Ill.
GUIDE TO THE COMPUTER PRODUCTION OF RANDOMIZED EXAMINATIONS.
N. A. Frigerio, and R. S. Stowe. Jun 73, 31p

Descriptors: (*Personnel, *Testing), (*Education, *Computer codes), Randomness.

For abstract, see NSA 28 08, number 20568.

ANL-8040/GA PC$4.00/MF$1.45
Argonne National Lab., Ill.
USAEC COMPUTER PROGRAM SUMMARIES. NUMBERS 1 THROUGH 54.
Apr 73, 39p
Contract W-31-109-eng-38

Descriptors: (*Computer codes, *Us aec), Anl, Programming.

For abstract, see NSA 28 07, number 17696.

BNL-17827/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
UNIQUE ASPECTS OF UTS REAL-TIME DATA ACQUISITION AT BNL.
P. C. Rogers, and J. J. Kolata. 11p CONF-730500-1

Descriptors: (*Real time systems, *Data acquisition systems), Bnl, Data acquisition, On-line systems, Reviews.

For abstract, see NSA 28 07, number 17688.

CEA-R-4396/GA PC$9.50/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
STUDY AND REALIZATION OF ULTRA-RAPID LOGIC CIRCUITS IN MIDDLE SCALE INTEGRATION.
M. Verhaeghe. Jun 73, 146p
In French. U.S. Sales Only.

Descriptors: (*Logic circuits, *Planning), (*Gating circuits, Planning).

For abstract, see NSA 28 08, number 20607.

COM-73-11693/1GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
COMPUTER INFORMATION SECURITY AND PROTECTION. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Sep 73,
Ann Harrison. Oct 73, 70p* NTIS-WIN-73-052

Descriptors: (*Computers, Protection), (*Information systems, Security), (*Bibliographies, Computers), Data transmission, Information retrieval, Time sharing, Electromagnetic shielding.
Identifiers: *Computer information security, *Computer privacy, Management information systems.

The NTISearch bibliography contains 65 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The reports included cover all aspects of computer information security, privacy, and protection.

COM-73-50842/6GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Systems Development Div.
REVIEW OF NETWORK MANAGEMENT PROBLEMS AND ISSUES.
Interim rept.,
A. J. Neuman. Oct 73, 80p NBS-TN-795
Grant NSF-AG-350
Paper copy available from GPO $1.00 as C13.46:795.

Descriptors: (*Data processing, Networks), (*Network analysis(Management), Data processing), (*Product development, Networks), Computation, Information systems, Education, Telecommunication, Marketing, Time sharing, Data processing terminals, Economic forecasting.
Identifiers: *Computer networks, Teleconferencing, Computer aided instruction.

Computer networking is broadly considered including hardware, software, procedures and people. Networking encompasses many activities; such as, creation of network products, distribution processes, user activities, and supporting services like marketing, documentation, information services and maintenance. Network management covers both the establishment of networking operations and actual operation of the network facilities. It includes all management functions performed at such network nodes as computing centers, documentation facilities, and service distribution centers. In order to survey the problems facing development of network management, user requirements and system requirements are outlined in a qualitative manner. Examples of political, economic and legal constraints are summarized, such as the economic impact of extended networks on regional and local computing activities. Critical issues for networking management, and other areas of significant management concern are outlined. Organizational alternatives are conceived in terms of a four layer organization model. (Modified author abstract)

JEN-267/GA PC$5.75/MF$1.45
Junta de Energia Nuclear, Madrid (Spain).
TWO PROGRAMS OF UTILITY IN THE PERFORMANCE OF HISTOGRAMS AND DALITZ PLOTS BY MEANS OF A CALCOMP-563 PLOTTER.
A. Carcedo, and P. Ladron de Guevara. 1973, 73p
In Spanish. U.S. Sales Only.

Descriptors: (*Computer codes, *Diagrams), Dalitz plot, Fortran, Ibm computers, Plotters, Univac computers.

For abstract, see NSA 28 08, number 20573.

KFK-1722/GA PC$8.50/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Reaktorentwicklung.
DESIGN PRINCIPLES OF THE GRAPHIC-SYSTEM.
G. Enderle, E. G. Schlechtendahl, U. Schumann, and R. Schuster. May 73, 129p
U.S. Sales Only.

Descriptors: (*Geometry, *Computer codes), (*Interactive display devices, *Data processing), (*Graphic, *Design), Mathematics.

For abstract, see NSA 28 08, number 20574.

KFK-1792/GA PC$4.50/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Reaktorentwicklung.
PRESENTATION OF MATERIAL PROPERTY DATA OF THE SYSTEM MAPLIB IN TABULAR AND GRAPHICAL FORM.
R. Schuster. May 73, 47p
In German. U.S. Sales Only.

Descriptors: (*Computer codes, *M codes), Diagrams, Fortran, Ibm computers, Physical properties, Tables.

For abstract, see NSA 28 08, number 18752.

LA-5219-MS/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
CDC 7600: FORTRAN OPTIMIZING TECHNIQUES.
F. McGirt, K. J. Melendez, and L. Rudsinski. Jun 73, 7p
Contract W-7405-eng-36

Descriptors: (*Programming, *Fortran), (*Cdc computers, Programming).

For abstract, see NSA 28 07, number 17699.

MLM-2011/GA PC$4.00/MF$1.45
Mound Lab., Miamisburg, Ohio.
IMPROVED EDITING AND COMPILING WITH THE DIGITAL PDP-8/I COMPUTER.
K. W. Foster. 26 Jul 73, 34p
Contract AT(33-1)-Gen-53

Descriptors: (*Pdp computers, *Programming), (*Data acquisition systems, Pdp computers), Programming languages.

For abstract, see NSA 28 07, number 17700.

MLM-2072/GA PC$4.00/MF$1.45
Mound Lab., Miamisburg, Ohio.
FDSR (ARG1,ARG2): A FOCAL PATCH FOR ACCESS TO THE NUCLEAR DATA 50/50 DATA STORAGE REGISTER.
F. X. Haas. 30 Jul 73, 11p
Contract AT-33-1-GEN-53

Descriptors: (*Computer codes, F codes), (*Multichannel analyzers, *Data acquisition systems), (*F codes, Multi-channel analyzers), Programming.

For abstract, see NSA 28 08, number 18388.

NVO-412-2/GA PC$5.45/MF$1.45
Computer Sciences Corp., Las Vegas, Nev. (Usa).
GET: GRAPHICS EDITING OF TEXT. USERS' MANUAL.
C. D. Lakeotes. May 73, 51p
Contract AT(26-1)-412

Descriptors: (*Computer codes, *G codes), (*Interactive display devices, *Cdc computers), Data processing, Magnetic disks, Magnetic tapes, Manuals, Testing.

For abstract, see NSA 28 08, number 20579.

NVO-412-3/GA PC$5.45/MF$1.45
Computer Sciences Corp., Las Vegas, Nev. (Usa).
GET: GRAPHICS EDITING OF TEXT. PROGRAM MANUAL.
C. D. Lakeotes. May 73, 71p
Contract AT(26-1)-412

Descriptors: (*Computer codes, *G codes), (*Interactive display devices, Computer codes), Cdc computers, Manuals, Testing.

For abstract, see NSA 28 08, number 20580.

NVO-412-4/GA PC$5.45/MF$1.45
Computer Sciences Corp., Las Vegas, Nev. (Usa).
GRAND: GRAPHICS ANALYSIS OF NUMERIC DATA. PROGRAM MANUAL.
C. D. Lakeotes. May 73, 150p
Contract AT(26-1)-412

Descriptors: (*Computer codes, *G codes), (*Data processing, Computer codes), Cartesian coordinates, Lagrange equations, Least square fit, Manuals.

For abstract, see NSA 28 08, number 20581.

NVO-412-5/GA PC$5.45/MF$1.45
Computer Sciences Corp., Las Vegas, Nev. (Usa).
GRAND: GRAPHICS ANALYSIS OF NUMERIC DATA. USERS' GUIDE.
C. D. Lakeotes. May 73, 64p
Contract AT(26-1)-412

Descriptors: (*Computer codes, *G codes), (*Data processing, Computer codes), Cartesian coordinates, Lagrange equations, Least square fit, Manuals.

For abstract, see NSA 28 08, number 20582.

N73-30139/2GA PC$3.25/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM: IBM 360 TSS IMPLEMENTATION. VOLUME 1: INSTALLATION STANDARDS.
Final Report.
Sep 73, 23p NASA-CR-134455
Contract NAS3-14979

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data systems, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1121

N73-30140/0GA PC$4.00/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM: IBM 360 TSS IMPLEMENTATION. VOLUME 2: OVERVIEWS.
Final Report.
Sep 73, 39p NASA-CR-134456
Contract NAS3-14979

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data systems, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1121

N73-30141/8GA PC$12.00/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM: IBM 360 TSS IMPLEMENTATION. VOLUME 3: DATA SET SPECIFICATIONS.
Final Report.
Sep 73, 199p NASA-CR-134457
Contract NAS3-14979

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data systems, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1121

N73-30142/6GA PC$31.75/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM: IBM 360 TSS IMPLEMENTATION. VOLUME 4: PROGRAM DESIGN SPECIFICATIONS.
Final Report.
Sep 73, 595p NASA-CR-134458
Contract NAS3-14979

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data systems, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1121

N73-30143/4GA PC$6.00/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM: IBM 360 TSS IMPLEMENTATION. VOLUME 5: RETRIEVAL COMMAND SYSTEM REFERENCE MANUAL.
Final Report.
Sep 73, 79p NASA-CR-134459
Contract NAS3-14979

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data retrieval, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1121

N73-30144/2GA PC$9.50/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM: IBM 360 TSS IMPLEMENTATION. VOLUME 6: NASIS MESSAGE FILE.
Final Report.
Sep 73, 149p NASA-CR-134460
Contract NAS3-14979

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data retrieval, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1121

N73-30145/9GA PC$4.25/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM: IBM 360 TSS IMPLEMENTATION. VOLUME 7: OPERATING SPECIFICATIONS.
Final Report.
Sep 73, 41p NASA-CR-134461
Contract NAS3-14979

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data retrieval, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1121

N73-30146/7GA PC$12.00/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM: IBM 360 TSS IMPLEMENTATION. VOLUME 8: DATA BASE ADMINISTRATOR USER'S GUIDE.
Final Report.
Sep 73, 197p NASA-CR-134462
Contract NAS3-14979

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data retrieval, *Handbooks, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1121

N73-30147/5GA PC$3.50/MF$1.45
Radio Corp. of America, Camden, N.J. Advanced Technology Labs.
SUMC MULTIPROCESSING OPERATING SYSTEM (MPOS) REQUIREMENTS DOCUMENT.
W. A. Helbig, L. C. Keller, D. A. Nelson, T. T. Schansman, and L. E. Vandergriff. 1972, 30p
NASA-CR-124371
Contract NAS8-29072

Descriptors: *Airborne/spaceborne computers, *Computer programs, *Data processing equipment, Computer programming, Input/output routines, Real time operation.

For abstract, see STAR 1121

N73-30148/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Inst. for Space Studies, New York.
A SURVEY OF COMPILER OPTIMIZATION TECHNIQUES.
P. B. Schneck. 1972, 8p NASA-TM-X-69499

Descriptors: *Compilers, *Computer techniques, *Optimization, Coding, Data acquisition, Flow charts, Fortran, Machine-independent programs, Matrices (Mathematics), Network analysis, Parallel programming, Source programs.

For abstract, see STAR 1121

N73-30149/1GA PC$3.75/MF$1.45
Ampex Corp., Redwood City, Calif. Advanced Technology Div.
DESIGN, FABRICATION, TESTING AND DELIVERY OF A FEASIBILITY MODEL LAMINATED FERRITE MEMORY.
Final Summary Report, 24 Jun. 1971 - 30 Mar. 1973.
H. C. Heckler. 27 Apr 73, 33p NASA-CR-124372, RR-73-6
Contract NAS8-27594

Descriptors: *Addressing, *Ferrites, *Laminates, *Magnetic cores, Arrays, Cathode ray tubes, Core storage.

For abstract, see STAR 1121

N73-30347/1GA PC$6.00/MF$1.45
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
MULTISPECTRAL SCANNER DATA PROCESSING ALGORITHM DOCUMENTATION.
Technical Report, 1 Nov. 1971 - 31 Jan. 1973.
M. Gordon, and J. Erickson. Jul 73, 80p NASA-CR-134007, ERIM-31650-149-T
Contract NAS9-9784
Misc-Original Contains Color Illustrations.

Descriptors: *Algorithms, *Computer programs, *Data processing, Analog to digital converters, Display devices, Mapping, Remote sensors.

For abstract, see STAR 1121

N73-30569/0GA PC$17.50/MF$1.45
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
THE MINIMUM DISTANCE APPROACH TO CLASSIFICATION.
A. G. Wacker, and D. A. Landgrebe. Oct 71, 306p
NASA-CR-133796, TR-EE-71-37
Contract NGL-15-005-112

Descriptors: *Classifications, *Multispectral band scanners, *Pattern recognition, *Vector analysis, Density distribution, Parameterization, Remote sensors, Statistical analysis.

For abstract, see STAR 1121

N73-31128/4GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
TIDY, A COMPLETE CODE FOR RENUMBERING AND EDITING FORTRAN SOURCE PROGRAMS. USER'S MANUAL FOR IBM 360/67.
A. V. Barlow, and G. N. Vanderplaats. Aug 73, 55p NASA-TM-X-62286
Subm-Prepared in Cooperation with Computer Sci. Corp., Mt. View, Calif. And Army Air Mobility R and D Lab., Moffett Field, Calif.

Descriptors: *Computers, *Data processing equipment, *Fortran, *Sequencing, *Time sharing.

For abstract, see STAR 1122

N73-31129/2GA PC$5.50/MF$1.45
National Aeronautical Establishment, Ottawa (Ontario). Structures Section.
SRCH: A HEADLAMP RESEARCH PROGRAM FOR THE EXTRAPOLATION/INTERPOLATION OF SURFACE VALUES FROM A PREDEFINED GRID.
A. L. Harrison. Jun 72, 70p LTR-ST-602

Descriptors: *Computer programs, *Extrapolation, *Grids, *Interpolation, *Luminaires, Coordinates, Mapping, Matrices (Mathematics), Plotting, Search profiles.

For abstract, see STAR 1122

N73-31130/0GA PC$3.25/MF$1.45
Rice Univ., Houston, Tex. Inst. for Computer Services and Applications.
USE OF SPATIAL INFORMATION IN CLASSIFICATION OF REMOTELY SENSED DATA.
D. L. Vanroony, and M. S. Lynn. May 73, 21p
NASA-CR-133988, ICSA-275-025-009
Contract NAS9-12776

Descriptors: *Classifications, *Data reduction, *Remote sensors, *Spatial dependencies, Accuracy, Algorithms, Maximum likelihood estimates, Subroutines.

For abstract, see STAR 1122

N73-31132/6GA PC$3.25/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM - IBM 360/370 OS MVT IMPLEMENTATION. 1: INSTALLATION STANDARDS.
Final Report.
Sep 73, 24p NASA-CR-134470
Contract NAS3-14979

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data systems, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1122

N73-31133/4GA PC$4.00/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM - IBM 360/370 OS MVT IMPLEMENTATION. 2: OVERVIEWS.
Final Report.
Sep 73, 38p NASA-CR-134471
Contract NAS3-14979

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data systems, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1122

N73-31134/2GA PC$12.25/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM - IBM 360/370 OS MVT IMPLEMENTATION. 3: DATA SET SPECIFICATIONS.
Sep 73, 202p NASA-CR-134472
Contract NAS3-14979
Seri-7.

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data systems, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1122

N73-31135/9GA PC$31.50/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM - IBM 360/370 OS MVT IMPLEMENTATION. 4: PROGRAM DESIGN SPECIFICATIONS.
Sep 73, 590p NASA-CR-134473
Contract NAS3-14979
Seri-7.

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data systems, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1122

N73-31136/7GA PC$5.75/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM - IBM 360/370 OS MVT IMPLEMENTATION. 5: RETRIEVAL COMMAND SYSTEM REFERENCE MANUAL.
Sep 73, 74p NASA-CR-134474
Contract NAS3-14979
Seri-7.

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data retrieval, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1122

N73-31137/5GA PC$9.50/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM - IBM 360/370 OS MVT IMPLEMENTATION. 6: NASIS MESSAGE FILE.
Sep 73, 150p NASA-CR-134475
Contract NAS3-14979
Seri-7.

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data retrieval, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1122

N73-31138/3GA PC$11.00/MF$1.45
Neoterics, Inc., Cleveland, Ohio.
NASIS DATA BASE MANAGEMENT SYSTEM - IBM 360/370 OS MVT IMPLEMENTATION. 7: DATA BASE ADMINISTRATOR USER'S GUIDE.
Sep 73, 180p NASA-CR-134476
Contract NAS3-14979
Seri-7.

Descriptors: *Computer programming, *Data management, *Data processing equipment, *Data retrieval, *Handbooks, *Safety management, Ibm 360 computer, Information flow, Management information systems.

For abstract, see STAR 1122

N73-31141/7GA PC$6.25/MF$1.45
Intermetrics, Inc., Cambridge, Mass.
GOAL-TO-HAL TRANSLATION STUDY.
Final Report.
J. H. Flanders, C. T. Helmers, and S. F. Stanten.
Jun 73, 85p NASA-CR-134033
Contract NAS9-12291

Descriptors: *Computer programs, *Programming languages, *Space shuttles, Airborne/spaceborne computers, Checkout, Semantics, Spacecraft launching, Translators.

For abstract, see STAR 1122

N73-31142/5GA PC$5.25/MF$1.45
Intermetrics, Inc., Cambridge, Mass.
SHUTTLE AVIONICS AND THE GOAL LANGUAGE INCLUDING THE IMPACT OF ERROR DETECTION AND REDUNDANCY MANAGEMENT.
Final Report.
J. H. Flanders, C. T. Helmers, and S. F. Stanten.
Jun 73, 63p NASA-CR-134034
Contract NAS9-12291

Descriptors: *Avionics, *Programming languages, *Space shuttles, Checkout, Error detection codes, Redundancy encoding, Spacecraft launching.

For abstract, see STAR 1122

N73-31143/3GA PC$8.50/MF$1.45
Aerophysics Research Corp., Houston Tex.
DIALOG: AN EXECUTIVE COMPUTER PROGRAM FOR LINKING INDEPENDENT PROGRAMS.
Technical Note, Jun. 1972 - Jun. 1973.
C. R. Glatt, D. S. Hague, and D. A. Watson. Sep 73, 130p NASA-CR-134032, JTN-01
Contract NAS9-12829

Descriptors: *Computer programming, *Univac computers, Computer programs, Computerized design, Simulation, Spacecraft design.

For abstract, see STAR 1122

N73-31145/8GA PC$5.75/MF$1.45
Auburn Univ., Ala. Engineering Experiment Station.
FLOATING-POINT SYSTEM QUANTIZATION ERRORS IN DIGITAL CONTROL SYSTEMS.
Final Technical Report.
C. L. Phillips. Jun 73, 73p NASA-CR-124382
Contract NAS8-28262

Descriptors: *Digital filters, *Error analysis, *Floating point arithmetic, Computer programs, Digital simulation, Probability density functions, Root-mean-square errors, Signal processing.

For abstract, see STAR 1122

N73-31148/2GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla. LV/Checkout Automation and Programming Office/LV-CAP.
GROUND OPERATIONS AEROSPACE LANGUAGE (GOAL): SYNTAX DIAGRAMS HANDBOOK.
L. R. Dickison. 16 Apr 73, 55p NASA-TM-X-69505, KSC-TR-1213

Descriptors: *Aerospace systems, *Programming languages, *Syntax, Checkout, Launch vehicles, Space shuttles.

For abstract, see STAR 1122

N73-31151/6GA PC$23.50/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
RALPH: AN ONLINE COMPUTER PROGRAM FOR ACQUISITION AND REDUCTION OF PULSE HEIGHT DATA.
R. C. Davies, R. S. Clark, and J. E. Keith. Apr 73, 427p NASA-TM-X-69507, ANCR-1103
NASA ORDER T-91867, Contract AT(10-1)-1375
Subm-Prepared in Cooperation with Aerojet Nucl. Co.

Descriptors: *Data acquisition, *Data processing, *Gamma rays, *On-line programming, *Radiation spectra, Computer storage devices, Data reduction, Pulse amplitude.

For abstract, see STAR 1122

N73-31152/4GA PC$4.75/MF$1.45
AEG-Telefunken, Konstanz (West Germany).
SYSTEM DESCRIPTION OF THE DIGITAL COMPUTER TR 16 SYSTEMBESCHREIBUNG DES DIGITALRECHNERS TR 16.
R. Klett. Jul 72, 53p BMBW-FB-W-72-22
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
In German; English Summary.

Descriptors: *Airborne/spaceborne computers, *Digital computers, *Systems analysis, Addressing, Computer systems programs, Digital data, Instruction sets (Computers), Programmed instruction, Registers (Computers).

For abstract, see STAR 1122

N73-31153/2GA PC$5.50/MF$1.45
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
SOME VALIDATION TESTS FOR AN ALGOL 60 COMPILER.
B. A. Wichmann. Mar 73, 70p NPL-NAC-33

Descriptors: *Algol, *Compilers, *Computer programming, *Proving, Computer systems programs, Great britain, Statistical analysis, Symbols, Systems analysis.

For abstract, see STAR 1122

N73-31154/0GA PC$3.25/MF$1.45
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
THE DEFINITION OF COMMENTS IN PROGRAMMING LANGUAGES.
R. S. Scowen, and B. A. Wichmann. May 73, 24p NPL-NAC-34

Descriptors: *Machine oriented languages, *Optimization, *Programming languages, Computer programming, Computer systems design, Criteria, Definition, Requirements.

For abstract, see STAR 1122

N73-31183/9GA PC$4.00/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
GUNN ELEMENTS FOR FAST DIGITAL CIRCUITS GUNNELEMENTE FUER SCHNELLE DIGITALSCHALTUNGEN.
K. Mause. Jun 72, 40p FTZ-A-474-TBR-3
In German; English Summary.

Descriptors: *Gunn effect, *Logic circuits, *Packing density, *Pulse code modulation, *Thermal resistance, Dipole moments, High speed, Integrated circuits, Threshold gates.

For abstract, see STAR 1122

ORO-3992-124/GA PC$3.00/MF$1.45
Texas Univ., Austin. Center for Particle Theory.
ADAPTATION OF THE AIP SEARCHABLE PHYSICS INFORMATION NOTICES FOR USE ON CDC 6000 SERIES COMPUTERS.
R. G. Parsons. Feb 72, 18p CPT-118

Descriptors: (*Information systems, *Cdc computers), Computer codes, Programming.

For abstract, see NSA 28 07, number 17691.

PAT-APPL-390466/GA PC$3.00/MF$1.45
Ampex Corp., Redwood City, Calif.
A METHOD FOR MAKING CONDUCTORS FOR FERRITE MEMORY ARRAYS.
Patent Application.
C. H. Heckler, Jr., P. D. Baba, and N. E. Bhiwanker. Filed 22 Aug 73, 11p NASA-CASE-LAR-10994-1,
Contract NAS1-8170
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Conductors, *Ferrites, *Memory, Alloys, Patent applications, Powder metallurgy.

The ferrite memory arrays are made from preformed metal conductors for the ferrite arrays. The conductors are made by forming a thin sheet of a metallizing paste of metal alloy powder, drying the paste layer, bisque firing the dried sheet at a first temperature, and then punching the conductors from the fired sheet. During the bisque firing, the conductor sheet shrinks to 58% of its pre-fired volume and the alloy particles sinter together. The conductors are embedded in ferrite sheet material and finally fired at a second higher temperature during which firing the conductors shrink approximately the same degree as the ferrite material.

PATENT-3 491 355/GA Not available NTIS
Department of the Navy Washington D C
AUTOMATIC DATA SEQUENCER.
Patent,
Louis R. Harrold. Filed 24 Jan 66, patented 20 Jan 70, 6p Rept nos. PAT-APPL-522 792,
Government-owned invention available for licensing. Copy of patnet available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Data processing systems, Control panels), (*Control panels, *Patents), Control sequences, Control systems, Wiring diagrams.
Identifiers: PAT-CL-340-365, *Computer systems hardware.

The patent describes an apparatus for entering and transmitting data comprising at least two distinguishable groups of selectable data is arranged and connected to operate in predetermined group sequence. An enabling means is included in each group of data entry means and is responsive to a predetermined condition for enabling the entry of data into the next successively operative group of data entry means. A further enabling means is operatively responsive to a predetermined condition of data entry into the last successively operative discrete group of data entry means for enabling a data transmission control element and a means responsive to external actuation of the transmitting control element is operative for automatically fulfilling any predetermined conditions of data entry into the last successively operative group of data entry means for enabling the data transmission control element.

PB-224 241/0GA PC$3.50/MF$1.45
Maryland Univ., College Park. Computer Science Center.
A MICROPROGRAMMED LEXICAL SCANNER.
Technical rept.,
Yaohan Chu. Dec 72, 62p* TR-218
Grant NSF-GJ-33013

Descriptors: (*Programming languages, Compilers), Microprogramming, Syntax, ALGOL, Algorithms, Parallel processors.
Identifiers: Lexical scanners, ALGOL 60 programming language, Lexical processors.

A lexical scanner accepts a string of characters in an external code and delivers a string of symbols in an internal code. The input string of characters is the source program, and the output string of symbols is to be manipulated by the other parts of an interpreter of a compiler. The paper describes the architectural design of a lexical scanner and the computer architecture for a hardware lexical scanner. For precise and concise description, the architectural design is presented in the architectural design language, and the computer architecture in the computer design language. The hardware lexical scanner is designed for implementation by using vertically microprogrammed control with a unique but simple micro-instruction format. (Author)

PB-224 397/0GA PC$3.00/MF$1.45
Lister Hill National Center for Biomedical Communications, Bethesda, Md.
MINICOMPUTERS IN HEALTH SCIENCES INSTRUCTION,
Christopher R. Brigham. Aug 73, 40p* LHNCBC-74-02

Descriptors: (*Programmed instruction, *Clinical medicine), Health, Education, Data processing, Time sharing, Calculators, Computerized simulation, Dictionaries.
Identifiers: *Minicomputers, *Computer aided instruction, Biomedical information systems, Medical computer applications, *Medical education.

The instructional role of the minicomputer is presently being explored by several health science institutions. The paper examines the history of the minicomputer, the present status and expected future of the hardware and software, its use as an instructional medium in the health sciences, related applications, and its potential for health sciences instruction. Minicomputers and larger machines are compared, and examples of the instructional use of minicomputer-based programmable calculators, single-user systems, intelligent terminals, time-sharing systems, and simulators are presented.

PB-224 398/8GA PC$3.75/MF$1.45
Maryland Univ., College Park. Computer Science Center.
INTRODUCING THE HIGH-LEVEL-LANGUAGE COMPUTER ARCHITECTURE.
Technical rept.,
Yaohan Chu. Feb 73, 76p* TR-227
Grant NSF-GJ-33013

Descriptors: (*Programming languages, Syntax), Semantics, FORTRAN, COBOL, ALGOL, Compilers, Interpreter routines, Programming manuals.
Identifiers: SNOBOL, Burroughs B5500 computers.

High-level-language (HLL) computer architecture refers to those computer systems which can accept one or more high-level languages (such as FORTRAN, ALGOL, SNOBOL, etc.). The paper classifies the HLL computer architecture into four types (von Neumann architecture, syntax-oriented architecture, indirect HLL architecture, and direct HLL architecture) based on the criterion of proximity in lexicality, syntax, and semantics between the high-level language and the machine language. It then introduces architecture of these high-level language processors. A simple example is employed to illustrate the differences among these four types of architecture. (Author)

PB-224 432/5GA PC$3.25/MF$1.45
Moore School of Electrical Engineering, Philadelphia, Pa.
PERTURBATION OF COMPUTER SYNTHESIZED SURFACES.
Technical rept. Nov 72-Apr 73,
David Strip, Lawrence Lieberman, and M. Joseph Willson. May 73, 22p 73-07 NSF-OCA-GJ34461-7307
Grant NSF-GJ-34461

Descriptors: (*Data processing, Graphic methods), Geometric surfaces.
Identifiers: *Computer graphics.

A technique is described for computer-generation of very complex three-dimensional surfaces with a surface perturbation such as golf ball dimples, moats, and steeples. Of three methods, the best made use of locally additive disturbance functions. Photographs illustrate the power of the method.

PB-224 484/6GA PC$3.75/MF$1.45
Pittsburgh Univ., Pa. Dept. of Computer Science.
DESIGN OF OPERATING SYSTEMS WITH MICRO-PROGRAMMED IMPLEMENTATION,
Walter H. Burkhardt, and Ronald C. Randel. 21 Sep 73, 94p* PIT-CS-BU-73-01

Descriptors: (*Operating systems(Computers), Design), Microprogramming, Monitor routines, Executive routines, Logic design, Algorithms.

Different phases appear in the development of operating systems. Five of these are identified, based on the total effort. As most prominent emerge the design and implementation phases. The design process is analyzed for determining the underlaying sequence of decisions, and identifying the interfaces, connections, views, and assumptions of the modules. One specific design is described as demonstration for the selection of the levels, the use of the implementation tools in the realization, and the combining of top-down and bottom-up decision-making for best results. The decision of micro-programmed implementation influences the design phase and the implementation techniques. Examples are drawn from the basic functions with micro - programs, also how instructions can be designed for supporting more complex functions. Suggestions for further research conclude the paper.

PB-224 540/5GA PC$4.00/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
DESIGN OF TOTALLY SELF-CHECKING ASYNCHRONOUS SEQUENTIAL MACHINES.
Master's thesis,
Daniel Avery Pitt. Sep 73, 39p UIUCDCS-R-73-593

Descriptors: (*Sequential circuits, Design), (*Asynchronous computers, Logic circuits), Mathematical logic, Switching circuits, Switching theory, Theses.
Identifiers: *Fault detection, *Fault tolerant computing, *Sequential machines.

Techniques have been developed for designing asynchronous machines that indicate faults by assuming error states. Design methods have also been found for the construction of self-checking combinational networks which indicate errors either in their coded inputs or in their own circuitry. The paper presents a means of uniting these two methods to yield asynchronous sequential machines which are self-checking. The problems inherent in the individual design procedures for the two methods as well as those which arise in making the two methods compatible are discussed.

PB-224 541/3GA PC$5.50/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
A PLATO LESSON TO TEACH BEGINBLOCKS.
Master's thesis,
Jamie MacNaughton Sammons. Aug 73, 67p UIUCDCS-R-73-599

Descriptors: (*Programming languages, Programming manuals), ALGOL, PL/1 programming language, Computer programs, Teaching machines, Theses, Programmed instruction.
Identifiers: *Computer aided instruction, PLATO 4 system, PLATO teaching system.

BEGINBLOCK is a PLATO 4 lesson written to teach the concept and use of begin blocks. Included in the report are an introduction to an description of the lesson, and a documentation and listing of the TUTOR code.

PB-224 852/4GA PC$3.00/MF$1.45
Mathematics and Computation Lab. (OEP), McLean, Va.
EMISARI: A MANAGEMENT INFORMATION SYSTEM DESIGNED TO AID AND INVOLVE PEOPLE.
Rod L. Renner, Robert M. Bechtold, Charles W. Clark, David O. Marbray, and Ronald L. Wynn.
Feb 73, 41p MCL-TM-230
Proceedings of the International Symposium on Computers and Information Science (COINS-72), (4th) Miami Beach, Fla. Dec 72, and at the ACM-SIGIR Symposium on Interactive Information Retrieval Systems, Fall Joint Computer Conference, Anaheim, Calif. Dec 72.

Descriptors: (*Information systems, Design), (*Management planning, Information retrieval), Consumers, Economic surveys, Data processing, Telephone systems, Computer programming.
Identifiers: EMISARI system, *Management information systems.

The EMISARI System described in the paper represents a major departure from conventional management information system design. It is oriented not toward data per se, but rather toward activities of the prople who generate and use the data. Thus it provides not merely for reporting up the chain of command, but also for dissemination of policy guidance and reference material down the chain, and for lateral communication among all users. It places a premium upon flexibility, to permit rapid system modifications in response to changes in user functions and needs and it offers a greatly simplified operation, to avoid any necessity for extensive user training or complex operation manuals. The overall approach may be viewed as a greatly modernized version of the classic telephone party line, using a computer to organize, selectively sort, and store-and-forward a constant flow of statistics, messages, estimates, reference materials, guidelines, notices, and other informational accountrements of a modern management operation. (Author)

RISO-M-1624/GA PC$3.00/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
USE OF THE DIGITAL PLOTTER IN ALGOL PROGRAMS ON THE B 6700.
P. Voss. Apr 73, 19p
U.S. Sales Only.

Descriptors: (*Plotters, *Algol), Computers, Digital systems, Manuals.

For abstract, see NSA 28 07, number 17701.

SLA-73-334/GA PC$5.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
CDC 6600 ROUTINES FOR SOME CUMULATIVE, MULTIVARIATE DISTRIBUTION FUNCTIONS.
D. E. Amos, and S. L. Daniel. Mar 73, 66p

Descriptors: (*Computer codes, *Distribution functions), (*Cdc computers, *Programming).

For abstract, see NSA 28 07, number 17703.

SLA-73-584/GA PC$4.25/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
SANDIA PANEL LANGUAGE.
R. E. Thompson. May 73, 43p

Descriptors: (*Electronic equipment, *Planning), (*Programming languages, Electronic equipment).

For abstract, see NSA 28 07, number 17704.

SLL-73-250/GA PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
USER'S MANUAL FOR CSPLINE (CUBIC SPLINE).
H. Quock. Jul 73, 26p
Contract AT(29-1)-789

Descriptors: (*Machine tools, Computer codes), (*Computer codes, *C codes), Manuals, Polynomials.

For abstract, see NSA 28 08, number 20588.

TID-26367/GA PC$3.00/MF$1.45
Argonne National Lab., Ill.
DMAIN, A GENERALIZED DISK UTILITY PROGRAM.
G. A. Concaildi, and R. D. George. 23 Mar 73, 6p

Descriptors: (*Cdc computers, Computer codes), (*Computer codes, *D codes), (*Data processing, Computer codes), Fortran, Magnetic tapes.

For abstract, see NSA 28 08, number 20591.

TID-26369/GA PC$3.00/MF$1.45
Argonne National Lab., Ill.
OPERATION MANUAL FOR PROGRAM "LARI".
G. A. Concaildi. 9 Apr 73, 5p

Descriptors: (*Computer codes, L codes), (*L codes, *Beam stacking), Cdc computers.

For abstract, see NSA 28 08, number 19094.

TID-26371/GA PC$3.00/MF$1.45
Argonne National Lab., Ill.
PROFIL, AN ON-LINE PROGRAM USED TO FIT GAUSSIAN-LIKE DATA.
G. A. Concaildi. 4 Apr 73, 7p

Descriptors: (*Computer codes, P codes), (*P codes, Spectroscopy), (*Spectroscopy, *Data processing), Gauss function.

For abstract, see NSA 28 08, number 18350.

UCID-16187/GA PC$5.25/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
FLYER CODE, A LUMINESCENCE DATA PROCESSING CODE IN LRLTRAN FOR THE CDC-6600.
G. R. Haugen. 6 Feb 73, 62p
Contract W-7405-eng-48

Descriptors: (*Luminescence, Computer codes), (*Computer codes, *F codes), Cdc computers, Data processing, Spectrometers, Spectroscopy, Three-dimensional calculations, Two-dimensional calculations.

For abstract, see NSA 28 07, number 17705.

UCLA-10-P-14-109/GA PC$3.25/MF$1.45
California Univ., Los Angeles. Dept. Of Computer Science.
BOUNDS ON THE NUMBER OF PROCESSORS AND TIME FOR MULTIPROCESSOR OPTIMAL SCHEDULES.
E. Fernandez, and B. Bussell. 1972, 25p CONF-720687-1
Contract AT(11-1)-Gen-10

Descriptors: (*Computers, *Management), (*Data processing, Management), (*Information retrieval, Management).

For abstract, see NSA 28 07, number 17693.

UCRL-51407/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
RESEARCH ON PIPELINE PROCESSORS: REVIEW OF LITERATURE ON SCHEDULING.
D. G. West. 14 Jun 73, 13p
Contract W-7405-eng-48

Descriptors: (*Industrial plants, *Computers), (*Management, Computers), Bibliographies, Reviews.

For abstract, see NSA 28 08, number 20594.

UCRL-74685/GA PC$3.25/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
PROBLEMS AND SOME SOLUTIONS FOR THE CREATION AND UTILIZATION OF LARGE INTERDISCIPLINARY COMPUTERIZED DATA BANKS.
V. E. Hampel. 1 Jul 73, 21p CONF-730719-1

Descriptors: (*Information systems, *Computers), Data processing, Information retrieval.

For abstract, see NSA 28 08, number 20554.

UCRL-74758/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
COMPUTER CENTER PLANNING.
V. W. Masson. 12p CONF-730336-1

Descriptors: (*Computers, *Management), Planning.

For abstract, see NSA 28 07, number 17706.

9D. Information Theory

AD-768 403/8GA PC$3.00/MF$1.45
Southeastern Massachusetts Univ North Dartmouth Dept of Electrical Engineering
SEQUENTIAL RECOGNITION SYSTEMS WITH INFORMATION FEEDBACK.
Technical note,
C. H. Chen. 20 Aug 73, 7p Rept no. TN-8 AFOSR-TR-73-1906
Grant AF-AFOSR-2119-71

Descriptors: (*Pattern recognition, Statistical analysis), Information theory, Feedback, Decision theory, Optimization.
Identifiers: Feature selection, Feature extraction.

In the paper, the author examines a class of sequential recognition systems which provide the receptor with information feedback. The informations include context, decisions made and the features already selected. The information feedback implies an on-line process in both feature selection and contextual analysis. The complete recognition system is a totally integrated system which takes into consideration the interactions (dependence) among all elements of the system. The problem of the overall system optimization is considered in the paper. By examining the average risk function, it is shown that the optimization can in fact be accomplished in two separate steps: (1) selecting the best feature set using all available measurements and the contextual information and (2) making the minimum risk decision using the context. The contextual information is based on what is best available. Further study is being made to improve the context with feature extraction. The information feedback can simplify the feature selection process as well as the overall system design to provide the same performance as a much more com-

plex recognition system without feedback. (Author)

AD-768 606/6GA Reprint
Polytechnic Inst of Brooklyn N Y Dept of Electrical Engineering
A SURVEY OF CODING THEORY: 1967-1972,
Jack K. Wolf. 5 Mar 73, 10p AFOSR-TR-73-1847
Contract F44620-72-C-0085
Availability: Pub. in IEEE Transactions on Information Theory, vIT19 n4 p381-389 Jul 73.

Descriptors: (*Coding, Reviews), Decoding, Algorithms.
Identifiers: Algebraic codes, Block codes, Reed-Muller codes, Convolutional codes.

The coding theory literature for the period 1967-1972 is surveyed. Four contributions considered to be of special merit are identified. A brief description of several books solely concerned with coding theory is presented. The major themes reflected in selected English-language journals are outlined. More than 100 references are cited to illustrate these themes. (Author)

AD-768 999/5GA PC$13.00/MF$1.45
Signatron Inc Lexington Mass
ADAPTIVE DATA TRANSMISSION STUDY.
Final rept. Sep 72-Jun 73,
Peter Monsen, and Steven H. Richman. Aug 73, 217p Rept no. SIG-A-148 RADC-TR-73-268
Contract F30602-73-C-0023

Descriptors: (*Information theory, Data transmission systems), (*Pulse communication systems, Adaptive systems), Radio communication systems, Coding, Decoding, Frequency modulation, Multiplex, Frequency dividers, Errors, Probability, Statistical analysis.
Identifiers: *Data transmission, Intersymbol interference, Viterbi decoding, Signal processing, *Tropospheric scatter communication, Maximum likelihood estimation.

A study was completed of feasible techniques for transmission of up to 13 megabits/second over a tropospheric-scatter channel. The techniques identified for this study were frequency-division-multiplex/frequency modulation, parallel processing of subchannel data, transmitter time-gating, receiver time-gating, coding techniques, maximum likelihood detection including the Viterbi algorithm, and adaptive equalization. The investigation considered a realistic channel model and terminal equipment constraints in a determination of technique performance, adaptability to a changing multipath channel, and implementability. A practical realization of a feedback equalizer was found to have superior performance relative to all other practical receivers considered. Moreover, the equalizer performance was within 1 dB of a bound for an ideal maximum likelihood decoder. (Modified author abstract)

COM-73-11580/0GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
WALSH FUNCTIONS. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Sept 73,
David W. Grooms. Sep 73, 36p* NTIS-WIN-73-038

Descriptors: (*Information theory, Functions(Mathematics)), (*Signal processing, Applications of mathematics), Pattern recognition, Coding theory, Switching theory, Data transmission, Fourier transformation, Data processing, Communication theory, Control theory, Bibliographies.
Identifiers: *Walsh functions, *Walsh transformation, Image processing, Walsh-Hadamard transformation.

The bibliography contains 31 selected abstracts of research reports retrieved using the NTIS on-line bibliographic search system--NTISearch. The abstracts include multidisciplinary applications of Walsh functions in signal processing. Main emphasis is placed on the use of Walsh functions in information theory, pattern recognition, image processing, and communications with related software and mathematical analysis. (Author)

N73-31095/5GA PC$3.50/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
DIGITAL CORRELATION METHOD FOR SYNCHRONIZATION OF PSEUDORANDOM BINARY SEQUENCES IN BLOCKWISE TRANSMISSION OF NON-OVERLAPPING SUBSEQUENCES EIN DIGITALES KORRELATIONSVERFAHREN ZUR SYNCHRONISATION PSEUDOZUFAELLIGER BINAERFOLGEN BEI BLOCKWEISER UEBERTRAGUNG NICHT UEBERLAPPENDER SUBSEQUENZEN.
G. Seifert. Jun 72, 30p FTZ-A-157-TBR-7
In German; English Summary.

Descriptors: *Bit synchronization, *Data correlation, *Data transmission, *Pseudorandom sequences, Binary data, Error signals.

For abstract, see STAR 1122

N73-31097/1GA PC$7.25/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
DATA ERROR PROTECTION BY MEANS OF LINEAR SYSTEMATIC BINARY CODES: A SURVEY DATENSICHERUNG MITTELS LINEARER, SYSTEMATISCHER BINAERCODES - EINE UEBERSICHTSSTUDIE.
R. Herzer. Jan 72, 102p FTZ-A-441-TBR-1
In German; English Summary.

Descriptors: *Binary codes, *Channels (Data transmission), *Signal encoding, *Telephony, Background noise, Error correcting devices, Error detection codes, High speed, Random errors.

For abstract, see STAR 1122

N73-31103/7GA PC$3.25/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
PROPERTIES OF CODES FOR CODE-TRANSPARENT DIGITAL TRANSMISSION LINKS EIGENSCHAFTEN VON CODES FUER CODE-TRANSPARENTE DIGITALE UEBERTRAGUNGSSTRECKEN.
J. Fahrendholz, H. W. Wellhausen, and D. Martin. Oct 72, 25p FTZ-44-TBR-35
In German; English Summary.

Descriptors: *Channels (Data transmission), *Decoding, *Signal encoding, Digital systems, Error signals, Pulse code modulation, Scrambling (Communication).

For abstract, see STAR 1122

N73-31106/0GA PC$3.00/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
DETERMINATION OF THE ESSENTIAL PARAMETERS OF A SECOND ORDER DIGITAL SYSTEM GESICHTSPUNKTE ZUR BESTIMMUNG DER WESENTLICHEN PARAMETER EINES DIGITALEN SYSTEMS ZWEITER ORDNUNG.
U. Assmus, and W. Bartel. Oct 72, 11p FTZ-442-TBR-40
Language in German.

Descriptors: *Bit synchronization, *Data transmission, *Time division multiplexing, High speed, Pulse code modulation.

For abstract, see STAR 1122

N73-31149/0GA PC$3.00/MF$1.45
Purdue Univ., Lafayette, Ind. School of Electrical Engineering.
SOURCE ENCODING FOR TWO-DIMENSIONAL DATA.
Final Report.
P. A. Wintz. Apr 73, 18p NASA-CR-132796, TR-EE-73-11
Contract NGR-15-005-106

Descriptors: *Abstracts, *Coding, *Data processing, Errors, Information theory, Pattern recognition, Telecommunication.

For abstract, see STAR 1122

PB-224 598/3GA PC$3.50/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
DIFFERENCE-PRESERVING CODES,
F. P. Preparata, and J. Nievergelt. Sep 73, 26p
UIUCDCS-R-73-602
Grant NSF-GJ-31222

Descriptors: (*Coding theory, Pattern recognition), Error correction codes, Mathematical logic, Algorithms, Binary digits.
Identifiers: Difference preserving codes, Hamming codes.

A code (of integers by binary sequences) is called difference-preserving (DP-code) if it has the following two properties: (1) If the absolute value of the difference between two integers is less than or equal to a certain threshold, the Hamming distance of their codewords is equal to this value. (2) If the absolute value of the difference between two integers exceeds the threshold, then the Hamming distance of their codewords also exceeds this threshold. Such codes (or slight modifications thereof) have also been called path-codes, circuit-codes, or snake-in-the-box codes. The paper discusses the application of DP-codes to pattern recognition and classification problems, and presents a construction of efficient DP-codes whose information content is asymptotically (in the length of codewords) of the order of theoretical upper bounds. (Author)

9E. Subsystems

AD-768 394/9GA PC$2.75/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
ADVANCED ELECTRONIC TECHNOLOGY.
Quarterly technical summary 1 May-31 Jul 73,
Melvin A. Herlin, Herbert G. Weiss, and Alan L. McWhorter. 15 Aug 73, 24p ESD-TR-73-237
Contract F19628-73-C-0002
See also report dated 15 May 73, AD-763 731.

Descriptors: (*Digital computers, Integrated circuits), (*Integrated circuits, Manufacturing methods), (*Air traffic control systems, Systems engineering), Circuit interconnections, Lithography, Semiconductors, Graphics, Vocoders, Display systems, Navigation, Lasers, Photodiodes, Microminiaturization(Electronics).
Identifiers: Quantum electronics, Semiconductor lasers, Infrared upconversion, Nonlinear optics.

The Quarterly Technical Summary covers the period 1 May 1973 through 31 July 1973. It consolidates the reports of Division 2 (Data Systems), Division 4 (Air Traffic Control), and Division 8 (Solid State) on the Advanced Electronic Technology Program. (Author)

AD-768 411/1GA PC$5.00/MF$1.45
Admiralty Surface Weapons Establishment Portsmouth (England)
DEGRADATION OF COMMUNICATION ON AWF WHIP ANTENNAS IN AN ICING ENVIRONMENT AT SEA.
Technical rept.,
R. Kilgour, and W. K. Brown. Jan 73, 58p Rept no. ASWE-TR-73-4 DRIC-BR-36594

Descriptors: (*Ship antennas, Sea ice), Omnidirectional antennas, Electrical impedance, Attenuation, Radiofrequency power, Cold weather tests, Great Britain.

Atmospheric conditions conducive to icing at sea are outlined, and the probable nature of the resulting ice accretion is discussed. The effects of saline ice accretion on communication efficiency of whip antennas, typically used in current Fishery Protection vessels, are assessed from measurements made on a representative antenna in the BAC Climatic Chamber in a simulated moderately severe icing environment. Communication efficiency is shown to be badly degraded by virtue of power dissipation in ice bridging the base insulator, and by the creation of an appreciable mismatch between transmitter and antenna. Some palliative measures are discussed and recommendations made to alleviate the situation. (Author)

AD-768 588/6GA Reprint
Texas Univ Austin Electronics Research Center
LINEAR MODE CONVERSION IN AN INHOMOGENEOUS ITERATIVE NETWORK,
B. N. Moore, and M. E. Oakes. 16 Apr 73, 3p
AFOSR-TR-73-1770
Contract F44620-71-C-0091
Sponsored in part by National Science Foundation, Washington, D. C.
Availability: Pub. in Applied Physics Letters, v23 n3 p119-120, 1 Aug 73.

Descriptors: (*Networks, Wave transmission), Propagation, Pulse systems, Capacitors, Coils, Delay lines.

An inductor capacitor (LC) with nearest-and second-neighbor inductive coupling between the capacitors is described and shown to exhibit linear wave transformation properties when the capacitor values vary iteratively down the lattice structure. Possible applications as a device for selectively delaying, transmitting, or storing pulses of slightly differing frequencies are suggested.

AD-768 618/1GA PC$3.75/MF$1.45
Raytheon Co Wayland Mass Advanced Development Lab
STUDY OF USE OF PHASED ARRAY TO ACHIEVE PENCIL BEAM OVER LIMITED SECTOR SCAN.
Final rept. 1 Feb 72-30 Jun 73,
Chien H. Tang, and Charles F. Winter. Jul 73, 97p
Rept no. ER73-4292 AFCRL-TR-73-0482
Contract F19628-72-C-0213

Descriptors: (*Phased arrays, *Lens antennas), Antenna radiation patterns, Numerical analysis, Programming(Computers), Beams(Electromagnetic), Simulation.
Identifiers: Computerized simulation.

A dual lens antenna design concept is investigated for the limited electronic scanning application. The antenna consists of an aperature lens, a focal field matching lens, and a phased array feed system. The main objective of the design concept is to achieve good pattern control over a limited angular scanning sector with a minimum number of control devices. It is concluded that the antenna design is theoretically feasible for the limited electronic scanning and other antenna applications. In addition, the antenna design has a number of basic advantages in comparison with other existing limited scan antennas. These include the minimum aperture size requirement, the small number of control devices, and good pattern control. The results of the analytical study indicate that a further design effort on hardware implementation aspects is warranted. Specific recommendations are made. (Author)

AD-768 619/9GA PC$5.25/MF$1.45
Martin Marietta Aerospace Orlando Fla
DORMANCY AND POWER ON-OFF CYCLING EFFECTS ON ELECTRONIC EQUIPMENT AND PART RELIABILITY.
Final rept. Mar 72-May 73,
J. Bauer, D. F. Cottrell, T. R. Gagnier, Edwin W. Kimball, and Thomas E. Kirejczyk. Aug 73, 185p*
Rept no. OR-12430 RADC-TR-73-248
Contracts F30602-72-C-0243, F30602-72-C-0247

Descriptors: (*Reliability(Electronics), *Electronic equipment), Failure(Electronics), Storage, Predictions, Life expectancy.

Two 12-month programs were conducted. The first was to collect, study, and analyze reliability information and data on dormant military electronic equipment and parts and to develop current dormant failure rates, factors, and prediction techniques. The second was to collect, study, and analyze reliability information and data on military electronic systems subjected to power on-off cycling, to correlate failure incidence with power on-off cycling, and to quantify power on-off cycling effects with respect to the dormancy and operating states. The data was processed and presented in the form of dormant and cyclic failure rates and factors by part types and subtypes for various part classes. Dormancy failure rate and cyclic ratio factor charts were constructed and partially validated. Environmental effects on the various part classes are discussed, together with factors relating them to one another in other energy states. (Author)

AD-768 728/8GA PC$3.00/MF$1.45
Harry Diamond Labs Washington D C
DESIGN AND DEVELOPMENT OF DIELECTRIC ROD ANTENNAS,
Howard S. Jones, Jr. Jul 73, 37p Rept no. HDL-TR-1640

Descriptors: (*Antennas, Dielectrics), Rods, Design, Antenna radiation patterns, Antenna feeds, Microwave equipment.
Identifiers: Dielectric rod antennas, End fire antennas.

A comprehensive study was made on dielectric rod radiators to develop them for use in microwave antenna systems. Several models were designed and constructed using various dielectric materials and advanced design techniques. Theory, design data, and impedance characteristics of these radiators, along with the properties of the dielectric rod materials are given. Performance characteristics for both single and multiple dielectric rod antenna designs are presented demonstrating a variety of feeding techniques. These end-fired radiators have high gain, low side lobes, high decoupling between individual elements, and, in some cases, broad bandwidth characteristics. They are efficient with good directivity and can be compactly designed with small aperatures. Because of these outstanding features, which can be seen from the results presented, dielectric rod radiators offer a decided advantage over electromagnetic horns and other types of microwave antennas. (Author)

AD-768 848/4GA PC$4.50/MF$1.45
Howard Univ Washington D C School of Engineering
A STUDY ON COMMUNICATON ANTENNA ISOLATION.
Final rept.,
Bing A. Chiang. Jun 73, 134p FAA-RD-73-94
Contract DOT-FA73WA-3156

Descriptors: (*Phased arrays, *Electromagnetic compatibility), Antenna radiation patterns, Radiofrequency interference, Admittance, Electrical impedance, Computer programs, Air traffic control systems, Antenna arrays.
Identifiers: FORTRAN.

Problems on FAA communication antennas related to isolation are analyzed. The concpet of using progressively phased circular array to achieve high isolation is studied. The method of study is divided into theoretical and experimental. Theoretical study involved using moment method. Symmetrical dipoles were used as elements. Factors analyzed include array radius, antenna size, position accuracy, impedance, radiation pattern, and isolation. The experimental study involved building scale antennas from existing FAA coaxial dipoles and used them as array elements, and simulated matrix feed conditions to study isolation and radiation pattern. An isolation of 55 db was found possible. The concept is shown to provide high isolation in a very limited space. It provides flexibility for beam forming, and azimuth scanning. (Author)

AD-768 854/2GA PC$3.75/MF$1.45
Martin Marietta Aerospace Orlando Fla
MANUFACTURING METHODS AND TECHNOLOGY STUDY COVERING METHODS FOR MANUFACTURING ELECTRONIC MODULES. PRINTED WIRING MODULE PRODUCIBILITY GUIDELINES AND SPECIFICATION FOR AUTOMATIC COMPONENT ASSEMBLY.
Final rept.,
Robert C. Rang. Jan 73, 96p Rept no. OR-12271 ILS-3-72
Contract DAAH03-71-C-0006
See also AD-768 855.

Descriptors: (*Modules(Electronics), Manufacturing methods), Printed circuits, Design, Specifications, Automation, Assembling, Production control.

The purpose of this program was to: (1) generate specification statements for the design of printed wiring assemblies that allows the assembly of components by mechanized insertion equipment; (2) develop a set of guidelines for printed wiring boards that facilitates compliance with the specification statements, and set forth standard design practices for the effective application of parameters and techniques that are unique to the mechanized assembly of components. The technical investigations and work performed to achieve the program objectives were defined in five basic tasks: Survey, Test Program, Design Guidelines, Specification Statements, and Standard Record Format. (Author)

AD-768 855/9GA PC$9.00/MF$1.45
Martin Marietta Aerospace Orlando Fla
MANUFACTURING METHODS AND TECHNOLOGY STUDY COVERING METHODS FOR MANUFACTURING ELECTRONIC MODULES. MANUFACTURING METHODS FOR ELECTRONIC MODULES.
Final rept. Mar 72-Jan 73,
William H. Pfeil, and Frederick E. Tantaglia. Jan 73, 561p Rept no. OR-12332 ILS-4-72
Contract DAAH03-71-C-0006
See also AD-768 854 and AD-768 856.

Descriptors: (*Modules(Electronics), Manufacturing methods), Printed circuits, Design, Plating, Cleaning, Machining, Drilling, Etching, Coatings, Soldering, Assembling, Instruction manuals, Automation, Production control, Guided missile components.

A process and workmanship manual for use in the manufacture of missile electronic modules was prepared, using an industry producer-user survey for state-of-the-art processes, materials, and equipment. The areas of manufacturing technology covered by this manual include cleaning, drilling, resist coating, etching, plating, assembling, soldering, and conformal coating. The information depicted in each area of technology covered includes materials, equipment, procedures, rework, in-production testing, and production checkpoints. Also, workmanship bulletins presented as Do's and Don'ts covering procedures, equipment, and processing materials

are presented for each area of technology. (Author)

AD-768 856/7GA PC$3.00/MF$1.45
Martin Marietta Aerospace Orlando Fla
MANUFACTURING METHODS AND TECHNOLOGY STUDY COVERING METHODS FOR MANUFACTURING ELECTRONIC MODULES. FINAL SUMMARY REPORT OF BASIC CONTRACT AND TWO AMENDMENTS,
Sol C. Osborne, Robert C. Rang, and William H. Pfeil. Jan 73, 28p* Rept no. OR-12358 ILS-5-72
Contract DAAH03-71-C-0006
See also AD-768 855, AD-768 854, and AD-768 857.

Descriptors: (*Modules(Electronics), Manufacturing methods), Printed circuits, Automation, Assembling, Design, Production control.

The project, made a careful study of current and projected module design and the available means (both manual and automatic) of manufacturing these modules. The objectives were: (1) Define current module designs and establish future design trends; (2) List the equipment currently available for setting up facilities for mechanized fabrication and assembly of electronic modules; (3) Perform a cost analysis at various levels of production for manufacturing facilities with different degrees of mechanization; (4) Design an N/C work center with complete specifications, equipment, layout, and block flow diagrams. Low, medium, and high production levels were treated for a balanced line operaton; (5) Generate military specification information to allow assembly by mechanized equipment; (6) Develop a set of design guidelines for use by MICOM electronic module suppliers; (7) Establish process problem areas of present module systems; (8) Forecast the direction of technological advance and the problem areas that might be encountered; (9) Prepare a set of manufacturing process and workmanship guidelines covering the production of planar printed wiring modules. (Modified author abstract)

AD-768 857/5GA PC$3.75/MF$1.45
Martin Marietta Aerospace Orlando Fla
MANUFACTURING METHODS AND TECHNOLOGY STUDY COVERING METHODS FOR MANUFACTURING ELECTRONIC MODULES. GUIDELINES FOR DESIGN OF PRINTED WIRING BOARDS FOR MECHANIZED ASSEMBLY.
Final rept.
Jul 72, 83p Rept no. OR-11656 ILS-1-72
Contract DAAH03-71-C-0006
See also AD-768 856, AD-768 855 and AD-768 854.

Descriptors: (*Modules(Electronics), Manufacturing methods), Printed circuits, Design, Automation, Assembling, Handbooks, Production control.

The handbook sets forth standard practices for the design of printed wiring boards for mechanized assembly of components. Guidelines define the basic design parameters and techniques that are peculiar to the mechanized insertion of discrete components and integrated circuit packages.

AD-768 871/6GA PC$3.00/MF$1.45
Rhode Island Univ Kingston Dept of Electrical Engineering
MIMIMAX RESTRICTED RANGE APPROXIMATION AND ITS APPLICATION TO THE DESIGN OF NONRECURSIVE DIGITAL FILTERS.
Technical rept.,
James T. Lewis. 28 Sep 73, 40p Rept no. URI-EE-4044/2
Contract N00014-68-A-0215-0006

Descriptors: (*Low-pass filters, Design), Band-pass filters, Minimax technique, Approximation(Mathematics), Theorems.
Identifiers: *Digital filters.

The design of nonrecursive digital filters is effected by means of minimax approximation in which the approximation is constrained to lie between two given restraining curves. The computational method is a multiple exchange algorithm which is the analogue of the Remes exchange algorithm. Efficient formulas are derived for the implementation of the algorithm. For an important prototype problem the effect of imposing the constraints, in terms of increased error, is studied mathematically. Numerical examples are discussed. (Author)

AD-768 872/4GA PC$3.00/MF$1.45
Rhode Island Univ Kingston Dept of Electrical Engineering
A DESCRIPTION OF THE FORTRAN PROGRAM 'FILTERS'.
Technical rept.,
James T. Lewis. 27 Sep 73, 26p Rept no. URI-EE-4044/3
Contract N00014-68-A-0215-0006

Descriptors: (*Electric filters, Design), (*Computer programs, Electric filters), Low-pass filters, High-pass filters, Minimax technique, Iterative methods.
Identifiers: FORTRAN, Digital filters, FILTERS computer program.

A FORTRAN program to compute minimax digital filters with or without horizontal restraining lines in the passband or stopband is described. A listing of the program and the output from the solution of two problems is included. (Author)

AD-768 873/2GA PC$3.00/MF$1.45
Rhode Island Univ Kingston Dept of Electrical Engineering
CONSTRAINED MINIMAX BEAMFORMING FOR LINE ARRAYS.
Technical rept.,
Donald W. Tufts, and Ronald A. Mucci. 25 Sep 73, 39p Rept no. URI-EE-4044/4
Contract N00014-68-A-0215-0006

Descriptors: (*Phased arrays, Antenna radiation patterns), Linear systems, Algorithms, Curve fitting, Sampling, Design.
Identifiers: Digital filters, Beam forming.

An algorithm, primarily intended for design of finite impulse response (FIR) digital filters possessing equiripple characteristics, is used for design of linear antenna arrays. This algorithm provides the capability of imposing upper and lower constraining functions on the beam pattern or response of the antenna array. Expressions are derived, relating parameters of the response of the antenna array to the parameters of the design algorithm. Interpretations of the effects of varying certain parameters of the array, including the effects of conventional beam steering, are presented by means of examples. (Author)

AD-768 874/0GA PC$3.00/MF$1.45
Rhode Island Univ Kingston Dept of Electrical Engineering
NOISE-REDUCING, NONRECURSIVE DIGITAL FILTERS.
Technical rept.,
Donald W. Tufts, James T. Lewis, and Ronald A. Mucci. 25 Sep 73, 45p Rept no. URI-EE-4044/5
Contract N00014-68-A-0215-0006

Descriptors: (*Low-pass filters, Design), Band-pass filters, Fourier analysis, Signal-to-noise ratio, Antenna arrays, Curve fitting, Graphics, Minimax technique, Algorithms.
Identifiers: *Digital filters, Signal processing, Spectrum analysis, Fourier transformation.

Techniques for the design of noise-reducing, nonrecursive digital filters are compared. Special emphasis is placed on a simple method for constraining the response of a filter at selected frequencies, including the edges of the passband, while minimizing the filter output noise power over a specified stopband of frequencies. These constraints can be used to shape the passband response, for example. The above mentioned constrained-points (CP) method is compared with three other of digital filter design which are based on the criteria of maximum energy-ratio or maximum SNR, minimax error subject to upper and lower restraining functions and least-squares approximation. The special problem of rejecting strong sinusoidal interferences without excessive change in passband response or putput noise power is shown to be well suited to the CP method of design. (Author)

AD-768 965/6GA PC$3.50/MF$1.45
Panametrics Inc Waltham Mass
ELECTROMECHANICAL BANDPASS RESONATOR FREQUENCY-SELECTIVE DEVICE.
Final rept., 7 Jun 72-7 May 73,
Emmanuel P. Papadakis. Aug 73, 73p RADC-TR-73-232
Contract F30602-72-C-0455

Descriptors: (*Band-pass filters, *Resonators), Piezoelectric transducers, Extremely low frequency, Spectrum analyzers, Attenuation.
Identifiers: Insertion loss, *Seismic detection.

The objective of this effort was to investigate electromechanical resonators that would permit the fabrication of field deployable spectrum analyzers for detecting mechanical vibrations generated by targets of interest. The advantages sought in this approach to target signature analysis include low cost, small size, low power consumption and reduced communications burden. This report describes the characteristics of several models of resonators that were constructed within the 175 to 800 Hz frequency range. The results indicate that it is feasible to build these devices in the frequency range of interest (20 to 2000 Hz) although the lower ranges are more difficult to achieve. These devices used piezoelectric transducers for coupling the energy in and out of the devices and attempts to directly couple audio or seismic energy to the input was only moderately successful.

AD-768 969/8GA PC$3.00/MF$1.45
Syracuse Univ N Y Dept of Electrical and Computer Engineering
COMPUTATIONAL METHODS FOR ANTENNA PATTERN SYNTHESIS,
Joseph R. Mautz, and Roger F. Harrington. Aug 73, 47p AFCRL-TR-73-0500
Contract F19628-73-C-0047

Descriptors: (*Antenna radiation patterns, Numerical analysis), Synthesis, Numerical methods and procedures.
Identifiers: Computation.

Some general numerical methods for antenna pattern synthesis, with and without constraints, are developed in this report. Particular cases considered are (1) field pattern specified in amplitude and phase, (2) field pattern specified in amplitude only, (3) these two cases with a constraint on the source quality factor. Both the source and the field are discretized at the beginning, and the methods of finite dimentional vector spaces are used for the computations. The theory is general, but is applied only to point sources arbitrarily distributed in a plane, and to pattern synthesis in this plane. Some numerical examples are given for ten sources approximately equispaced on one-half of an ellipse, with the desired field pattern chosen to be the cosecant phi pattern in the first quadrant. (Author)

AD-769 002/7GA PC$3.50/MF$1.45
Ohio State Univ Columbus Electroscience Lab
THEORETICAL AND EXPERIMENTAL INVESTIGATIONS RELATED TO SATELLITE ANTENNA PROBLEMS.
Final technical rept. 1 Jul 72-30 Jun 73,
G. A. Thiele, E. H. Newman, and T. H. Newhouse. Aug 73, 54p Rept no. ESL-3468-2

Contract N00014-67-A-0232-0018

Descriptors: (*Satellite antennas, *Slot antennas), Antenna radiation patterns, Electrical impedance, Design, Antenna feeds, Mathematical analysis.

The report summarizes applied research undertaken between 1 July 1972 and 30 June 1973 to investigate several problems related to satellite antennas. Briefly, the investigations undertaken can be classified under three topical headings. The first deals with methods for calculating the radiation patterns and impedance of various antennas mounted on various geometries. The second topical heading deals with theoretical methods for analyzing and designing cavity-backed slot antennas such as the T-bar fed slot. The third heading deals with an experimental parametric study of the one port T-bar fed slot antenna. The report concludes with recommendations for future investigations leading to improved satellite antenna techniques. (Author)

AD-769 010/0GA Reprint
Frank J Seiler Research Lab United States Air Force Academy Colo
PROXIMITY EFFECTS FOR PARALLEL RECTANGULAR CONDUCTORS IN NON TRANSMISSION-LINE MODE,
Robert W. Burton. 25 Sep 72, 6p Rept no. SRL-TR-73-0010
Revision of report dated 19 Jun 72.
Availability: Pub. in IEEE Transactions on Antennas and Propagation, vAP21 n4 p583-585 Jul 73.

Descriptors: (*Antennas, Efficiency), Electric currents, Radio transmission, Loop antennas.
Identifiers: Electrically short antennas.

In applications of electrically short antennas such as multiturn loops, variations in ohmic losses due to proximity effects can significantly affect uncorrected estimated of efficiency. The paper investigates experimentally the proximity effects on the current distributions and associated ohmic losses for two identical parallel rectangular cross-section conductors as a function of separation distance and cross section. Based upon the experimental results, a first-order theory is developed and verified. (Author)

AD-769 069/6GA PC$3.50/MF$1.45
Varian Associates Palo Alto Calif Twt Div
PARALLEL PULSED TWT AMPLIFIER.
Final rept. 1 Jun-30 Sep 73,
Lawrence Wood. Oct 73, 57p
Contract N00014-73-C-0462

Descriptors: (*Traveling-wave tubes, *Microwave amplifiers), Radiofrequency power, Radiofrequency pulses, Performance(Engineering).

Four 1 kW pulsed traveling wave tubes were combined in parallel to produce greater than 4 kW over the I/J band octave from 8.0 to 16.0 GHz. Combining loss due to phase and amplitude imbalance in the TWTs was found to average 0.2 dB. Combining loss attributable to insertion loss and VSWR amounted to 0.5 dB per output combining magic tee. Double-ridge waveguide magic tees and TWTs were evaluated for extended frequency operation and higher output power as a function of frequency while varying cathode voltage, grid drive voltage, input rf drive level, and duty cycle. (Author)

AD-769 098/5GA PC$3.50/MF$1.45
RCA Labs Princeton N J
VOLUME HOLOGRAPHIC MATERIAL DEVICE FEASIBILITY FOR MAP DISPLAY APPLICATIONS.
Final rept. 18 May 72-17 May 73,
William J. Burke, and David L. Staebler. Jun 73, 59p* Rept no. PRRL-73-CR-34
Contract N62269-72-C-0793

Descriptors: (*Stereoscopic display systems, Maps), (*Photographic recording systems, Stereoscopic photography), Photographic materials, Lithium compounds, Niobates, Electrooptics, Feasibility studies.
Identifiers: *Holographic information storage, Lithium niobates, Electronic display systems.

The report describes the results of a program to apply recent advances in the area of volume phase holographic materials for map storage and display applications, and to develop and evaluate subsystem components and techniques for this purpose. The major achievement of this program was the recording and fixing of up to 100 holograms in a given volume using a new technique for fixing in heavily iron-doped LiNbO3. In addition, a mechanical random-access system for retrieving up to 100 holograms was developed and tested. An investigation was made of direct and indirect display formats, including incoherent readout of thick phase holograms and the recording and playback of encoded object transparencies on a color kinescope. This led to the conclusions that electronic pickup of the readout image is required for maximum use of the potential of a volume holographic storage system. (Author)

N73-30208/5GA PC$10.25/MF$1.45
Royal Aircraft Establishment, Farnborough (England).
RELIABILITY IMPROVEMENT BY REDUNDANCY IN ELECTRONIC SYSTEMS. PART 3: A QUANTITATIVE COMPARISON OF REDUNDANCY SCHEMES.
T. F. Klaschka. Mar 73, 163p RAE-TR-72200, BR34201

Descriptors: *Component reliability, *Logic design, *Redundant components, *Reliability engineering, Circuit reliability, Cost estimates, Gates (Circuits), Logic circuits, Redundancy.

For abstract, see STAR 1121

N73-31105/2GA PC$4.00/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
DISPLAY OF DIAL NUMBERS, CALL TARIFF UNITS AND DATA BY LUMINESCENT DIODES FOR TOUCH-TONE TELEPHONE SETS ANZEIGE VON WAEHLZIFFERN, GEBUEHRENEINHEITEN UND DATEN BEI FERNSPRECHTISCHAPPARATEN MIT TASTENWAHL DURCH LUMINESZENZ - DIODEN.
J. Kirchner. Jul 72, 40p FTZ-421-TBR-4
In German; English Summary.

Descriptors: *Diodes, *Display devices, *Liquid crystals, *Telephony, Data transmission, Dials, Luminescence, Metal oxide semiconductors, Random access memory, Transistor logic.

For abstract, see STAR 1122

N73-31176/3GA PC$5.50/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
DESIGN AND FUNCTION OF ANECHOIC FUNNEL AND RECTANGULAR CHAMBERS FOR ANTENNA TESTS.
H. Hollmann. Nov 71, 67p FTZ-A-454-TBR-13
In German; English Summary.

Descriptors: *Absorbers (Materials), *Anechoic chambers, *Antenna radiation patterns, *Electromagnetic absorption, *Microwave antennas, Funnels, Reflectance, Standing wave ratios.

For abstract, see STAR 1122

N73-31177/1GA PC$3.50/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
MULTIMODE COAXIAL FEED FOR LARGE APERTURE PARABOLIC ANTENNAS MEHRMODEN-KOAXIALERREGER FUER PARABOLANTENNEN MIT GROSSEM OEFFNUNGSWINKEL.
K. Seher. Jul 72, 26p FTZ-A-454-TBR-14
Language in German.

Descriptors: *Antenna feeds, *Multimode resonators, *Parabolic antennas, *Parabolic reflectors, Antenna radiation patterns, Apertures, Coaxial cables, Modes (Standing waves), Symmetry.

For abstract, see STAR 1122

N73-31178/9GA PC$3.25/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
INTRODUCTION TO CONCEPTION AND APPLICATION POSSIBILITIES OF PHASED ARRAYS EINFUEHRUNG IN KONZEPTIONS- UND ANWENDUNGSMOEGLICHKEITEN PHASENGESTEUERTER GRUPPENANTENNEN.
K. P. Dombek. Feb 72, 24p FTZ-A-454-TBR-15
Language in German.

Descriptors: *Antenna radiation patterns, *Phased arrays, Antenna design, Antenna feeds, Satellite antennas.

For abstract, see STAR 1122

N73-31179/7GA PC$4.25/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
OMNIDIRECTIONAL ANTENNA WITH POLYGON REFLECTORS AND COSECANT RADIATION PATTERN FOR TELECASTING IN THE 12 GHZ FREQUENCY RANGE RUNDSTRAHLANTENNE IN POLYGONREFLEKTORBAUWEISE MIT KOSEKANSFOERMIGEM ELEVATIONSRICHTDIAGRAMM FUER DIE FERNSEHVERSORGUNG IM 12 GHZ-FREQUENZBEREICH.
K. Hoffmann. Apr 72, 42p FTZ-A-454-TBR-16
Language in German.

Descriptors: *Antenna design, *Antenna radiation patterns, *Omnidirectional antennas, *Television transmission, Broadcasting, Polygons, Reflectors, Superhigh frequencies, Trigonometric functions.

For abstract, see STAR 1122

N73-31675/4GA PC$3.50/MF$1.45
Georgia Inst. of Tech., Atlanta.
COMPLEX PERMITTIVITY MEASUREMENTS DURING HIGH TEMPERATURE RECYCLING OF SPACE SHUTTLE ANTENNA WINDOW AND DIELECTRIC HEAT SHIELD MATERIALS.
H. L. Bassett, and S. H. Bomar, Jr.. Sep 73, 72p
NASA-CR-2302, A-1389
Contract NAS1-11267

Descriptors: *Heat shielding, *Permittivity, *Space shuttles, *Spacecraft antennas, *Waveguide windows, Atmospheric entry simulation, High temperature tests, Reentry effects, Thermal cycling tests, Thermocouples.

For abstract, see STAR 1122

N73-31764/6GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SUMMARY OF ATTITUDE DYNAMIC ANALYSIS FOR IMP-J WIRE ANTENNA SPACECRAFT.
L. W. Bell. Sep 73, 26p NASA-TM-X-70465, X-732-73-256

Descriptors: *Antennas, *Explorer satellites, *Spacecraft design, Computer programs, Deployment, Mission planning.

For abstract, see STAR 1122

PAT-APPL-310193/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PHOTOMULTIPLIER CIRCUIT INCLUDING MEANS FOR RAPIDLY REDUCING THE SENSITIVITY THEREOF.
Patent Application.
J. O. Mcclenahan. Filed 28 Nov 72, 10p NASA-CASE-ARC-10593-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Current regulators, *Photomultiplier tubes, *Radiation tolerance, *Voltage regulators, Electric potential, Patent applications, Short circuits, Switching circuits.

A simple, reliable and inexpensive control circuit is provided for rapidly reducing the bias voltage across one or more of the dynode stages of a photomultiplier, to substantially decrease its sensitivity to incoming light at those times where excess light intensity might damage the tube. The control circuit comprises a switching device, such as a silicon controlled rectifier (SCR), coupled between a pair of the electrodes in the tube, preferably the cathode and first dynode, or the first and second dynodes, the switching device operating in response to a trigger pulse applied to its gate to short circuit the two electrodes. To insure the desired reduction in sensitivity, two switching devices may be employed between two of the electrode stages, the devices being operated simultaneously to short circuit both stages.

PAT-APPL-389929/GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DIGITAL PHASE LOCKED LOOP.
Patent Application.
R. A. Cliff. Filed 20 Aug 73, 23p NASA-CASE-GSC-11623-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Closed cycles, *Digital techniques, *Phase locked systems, Accumulators (Computers), Analog circuits, Patent applications, Phase detectors.

An all digital phase-locked loop is reported that derives an output signal from an accumulator output terminal. A phase detecting exclusive OR gate is fed by the loop digital input and output signals. The output of the phase detector is a bi-level digital signal having a duty cycle indicative of the relative phase of the input and output signals. The accumulator is incremented at a first rate in response to a first output level of the phase detector and at a second rate in response to a second output level of the phase detector.

PATENT-3 495 158/GA Not available NTIS
Department of the Navy Washington D C
HARMONIC GENERATOR SYSTEM.
Patent,
James R. Garnett, Joseph D. Segrest, and Edward C. Lesoravage. Filed 23 May 68, patented 10 Feb 70, 4p Rept nos. PAT-APPL-731 527,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Harmonic generators, *Patents), Aircraft equipment, Power supplies, Test equipment.
Identifiers: PAT-CL-321-52.

The patent describes a system for generating polyphase odd harmonics of a fundamental frequency derived from but one phase of a high power polyphase source, both the magnitude and relative phase of the harmonics with respect to the fundamental being variable and controllable. The harmonic may be injected into a polyphase aircraft power system to both evaluate the response thereto and provide harmonics of equal magnitude but opposite phase relation to balance out inherent aircraft system harmonics.

PATENT-3 500 067/GA Not available NTIS
Department of the Navy Washington D C
SYMMETRICAL WAVEFORM RATE-OF-RISE CLIPPER AMPLIFIER.
Patent,
Robert K. Davis, and Foster B. Nolley. Filed 11 Jul 66, patented 10 Mar 70, 4p Rept nos. PAT-APPL-564 452,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Transistor amplifiers, *Patents), Feedback, Clipper circuits.
Identifiers: Class A amplifiers, Clipper amplifiers, PAT-CL-307-237.

The patent describes a symmetrical waveform rate-of-rise clipper class A amplifier having a pair of collector-to-base coupled transistors, the second in the series being in emitter follower output with a feedback through reversely oriented diodes to the base input of the first in the series of transistors. The input to the base electrode of the first in the series of transistors is through an isolation means, such as a resistor or amplifier, and this base electrode is stabilized in voltage bias from a voltage divider circuit to minimize amplifier output jitter and to insure fast rise rate for short rise time of the output signals.

PATENT-3 500 145/GA Not available NTIS
Department of the Navy Washington D C
THIN VAPOR-DEPOSITED METAL FILM VOLTAGE REGULATOR.
Patent,
Robert D. Hitchcock. Filed 1 Mar 67, patented 10 Mar 70, 5p Rept nos. PAT-APPL-620 214,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Voltage regulators, *Patents), Metal films, Dielectric films, Aluminum, Alumina, Manganese, Lead, Vapor plating, Vacuum apparatus, Integrated circuits.
Identifiers: Thin films, PAT-CL-317-238.

The patent describes a thin film voltage regulator and its method of manufacture comprising a sandwich of aluminum, aluminum oxide, manganese and lead. The thickness of the regulator is of the order of 0.00001 cm. The manufacture comprises vaporizing and depositing the aluminum, manganese and lead at a pressure of only 0.001 torr with an oxidation step after the depositing of aluminum. A double mask arrangement facilitates ease of manufacture.

PATENT-3 500 172/GA Not available NTIS
Department of the Navy Washington D C
HIGH VOLTAGE, HIGH POWER SERIES REGULATOR.
Patent,
Royal W. Eckstein, Jr. Filed 21 Jun 67, patented 10 Mar 70, 5p Rept nos. PAT-APPL-648 535,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Voltage regulators, *Patents), Direct current, Transistor amplifiers, Avalanche diodes, Power dividers.
Identifiers: High voltage, PAT-CL-323-9, Differential amplifiers.

The patent describes a high voltage, high power solid-state regulator circuit, having a Zener referenced differential amplifier for sensing load requirements and providing an error signal to a common-base amplifier. This common-base amplifier is coupled to a first pair of transistors arranged in a Darlington configuration which are, in turn, coupled to a plurality of load sharing regulating sections, each section including a pair of transistors in a Darlington configuration coupled to a third transistor which acts as an error sensor and D.C. amplifier. These load sharing regulating sections are coupled to one another and to a resistive divider network in such a manner that the error sensing third transistor within each section causes its associated Darlington pair to assume its proportionate share of the load. A small current through the resistive divider network controls the division of voltages between the load sharing sections.

PATENT-3 551 850/GA Not available NTIS
Department of the Navy Washington D C
SUPPRESSED-CARRIER MODULATOR.
Patent,
Louis R. Rudolph, and Joseph A. Dalpee. Filed 14 Nov 68, patented 29 Dec 70, 4p Rept nos. PAT-APPL-775 839,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Modulators, *Patents), Electric bridges, Field effect transistors.
Identifiers: Suppressed carrier modulators, PAT-CL-332-44.

The patent concerns a transformerless suppressed-carrier modulator. It comprises a field-effect transistor bridge circuit which modulates a carrier frequency signal with two audio input signals, which differ in phase by 180 degrees, to produce two modulated signals having carrier, upper sideband, and lower sideband components with polarities such that after substraction by a differential amplifier the carrier components cancel and only the upper and lower sideband signals are fed to the output of the device.

PATENT-3 700 952/GA Not available NTIS
Department of the Navy Washington D C
HIGH POWER PULSED MICROWAVE SOURCE.
Patent,
John A. Nation. Filed 30 Aug 71, patented 24 Oct 72, 4p Rept nos. PAT-APPL-175 887,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Pulse generators, *Patents), (*Radiofrequency generators, Patents), Microwave equipment, Signal generators, Microwaves.
Identifiers: PAT-CL-315-3-5.

The patent relates to microwave pulses at power levels in excess of 10 megawatts and of short duration and narrow bandwidth produced by propagating an annular relativistic electron beam carrying currents of 30-40 kA at energies of 200-500 keV through a cylindrical, symmetrical annular, ridged wave guide. The interaction between this beam and a backward wave in the guide leads to the oscillations.

PATENT-3 701 059/GA Not available NTIS
Department of the Navy Washington D C
REMOTE CONTROLLED, ADJUSTABLE BANDWIDTH LOW PASS FILTER.
Patent,
Reuben E. Nyswander. Filed 16 Apr 71, patented 24 Oct 72, 4p Rept nos. PAT-APPL-134 777,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Low-pass filters, *Patents), Remote control systems, Adaptive systems, Bandwidth, Semiconductor devices.
Identifiers: PAT-CL-333-70-A.

The patent describes a bandwidth controlled, low pass filter circuit having a resistor, capacitor, voltage follower amplifier, and an insulated gate, metallic oxide semiconductor, field effect transistor used as a switch. The transistor and the resistor, together, provide the effective circuit filter resistance, and the bandwidth is controlled by the transistor gate pulse frequency and pulse width. The use of several such filters as a filter bank is also disclosed.

PATENT-3 701 143/GA Not available NTIS
Department of the Navy Washington D C
WALSH FUNCTION GENERATOR.
Patent,
George G. Nacht. Filed 24 Aug 70, patented 24 Oct 72, 7p Rept nos. PAT-APPL-66 418,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Signal generators, *Patents), Functions.
Identifiers: *Function generators, *Walsh function generators, PAT-CL-340-347-DD.

The patent describes a clock driven generator which produces desired Walsh functions in response to binary number input command signals. The input command signals are connected to be operated on by various circuitry and thereby produce output signals which are individually a particular bit of a desired Walsh function. The Walsh function is obtained by scanning the output signals.

PATENT-3 701 144/GA Not available NTIS
Department of the Navy Washington D C
HIGH FREQUENCY ANALOG-TO-DIGITAL CONVERTER.
Patent,
Dennis E. Fineran, and Samuel J. Fendley. Filed 28 Oct 70, patented 24 Oct 72, 6p Rept nos. PAT-APPL-84 684,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Analog-to-digital converters, *Patents), Signal generators, Coding, Samplers.
Identifiers: PAT-CL-340-347-AD.

The patent describes an analog-to-digital converter having a signal generator. It provides a sinusoidal reference signal which is to be compared to a high frequency analog signal, a plurality of threshold units each biased to trigger an output signal at a predetermined discrete level of the difference between the reference signal and the analog signal, a memory reset unit receiving the reference signal and providing a reset signal for clearing the output signals therefrom at a predetermined time in each cycle of the reference signal, and an encoder receiving the output signals of the threshold units and converting them into a digital code. The time of the reset signal is determined to be after either positive or negative peak of the reference signal.

PATENT-3 737 789/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
COUNT RATE DISCRIMINATOR.
Patent,
Donald D. McCoy, Bruce H. Shue, and Ralph G. Gutmacher. Filed 21 Dec 71, patented 5 Jun 73, 7p PAT-APPL-210 343
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Pulse discriminators, *Patents), Counting circuits, Logic circuits, Cathode ray tubes, Fluorescent screens.
Identifiers: PAT-CL-328-138.

The patent concerns a count rate discriminator which detects pulsed input signals having a pulse repetition rate within a selectable lower and higher pulse rate limit and which passes, during a predetermined time period, only those input pulses contributing to exceed the preselected low limit pulse rate providing said input pulse rate does not exceed the preselected high limit.

PATENT-3 746 998/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
AUTOMATIC CARRIER ACQUISITION SYSTEM.
Patent.
R. C. Bunce. Patented 17 Jul 73, 6p NASA-CASE-NPO-11628-1,
Misc-Filed 13 Dec. 1971 Supersedes N72-20156 (10 - 11, p 1439). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Carrier frequencies, *Loop antennas, *Phase locked systems, *Receivers, Bandpass filters, Direct current, Multipliers, Optimization, Oscillators, Patents, Tuning.

An automatic carrier acquisition system for a phase locked loop (PLL) receiver is disclosed. It includes a local oscillator, which sweeps the receiver to tune across the carrier frequency uncertainty range until the carrier crosses the receiver IF reference. Such crossing is detected by an automatic acquisition detector. It receives the IF signal from the receiver as well as the IF reference. It includes a pair of multipliers which multiply the IF signal with the IF reference in phase and in quadrature. The outputs of the multipliers are filtered through bandpass filters and power detected. The output of the power detector has a signal dc component which is optimized with respect to the noise dc level by the selection of the time constants of the filters as a function of the sweep rate of the local oscillator.

PATENT-3 750 067/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
FERROFLUIDIC SOLENOID.
Patent.
E. E. Sabelman. Patented 31 Jul 73, 8p NASA-CASE-NPO-11738-1,
Misc-Filed 16 Mar. 1972 Supersedes N72-25269 (10 - 16, p 2134). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Electromechanical devices, *Force, *Signal reception, Actuators, Distortion, Elastomers, Ferromagnetic materials, Magnetic fields, Patents.

An electromechanical actuator for producing mechanical force and/or motion in response to electrical signals is disclosed. The actuator includes a ferromagnetic fluid and a coil which are contained within an elastomeric capsule. Energization of the coil by application of current to a pair of coil electrodes extending through the walls of the elastomeric capsule produces distortion of the capsule, i.e., radial expansion and axial contraction. This distortion is caused by the redistribution of the ferromagnetic fluid within the capsule under the influence of the magnetic field. Variation of the current input will produce corresponding variations in the degree of capsule distortion.

9F. Telemetry

AD-768 668/6GA PC$2.75/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
A STATE OF THE ART PULSE AMPLITUDE DECOMMUTATOR DESIGN.
Instrumentation papers,
Terry M. Lamb. 31 Jul 73, 23p Rept nos. AFCRL-TR-73-0478, AFCRL-IP-200

Descriptors: (*Commutators, Telemeter systems), Pulse amplitude modulation, Phase-locked systems, Design.
Identifiers: *Decommutators.

The instrumentation report describes the design and application of a Pulse Amplitude Decommutator designed and built by the author. The unit has been successfully used for flight evaluation of telemetry at the Air Development Test Center (A.D.T.C.), Eglin AFB, Florida as part of the HAVE GENIE two (Oct 72) and at the Barrera do Inferno Research Range, Natal, Brazil, as part of the MARKOV EFFECT (MKV-1) program. The paper also presents basic material on the theory and application of Pulse Amplitude Telemetry systems. (Author)

N73-30120/2GA PC$7.00/MF$1.45
Missouri Univ., Rolla.
DIGITAL DATA DETECTION AND SYNCHRONIZATION.
Final Report.
T. L. Noack, and J. F. Morris. Aug 73, 96p NASA-CR-132809
Contract NGR-26-003-044

Descriptors: *Bit synchronization, *Receivers, *Synchronizers, *Telemetry, Digital data, Satellite-borne instruments, Signal to noise ratios, Simulation, Tape recorders.

For abstract, see STAR 1121

N73-31088/0GA PC$3.00/MF$1.45
Purdue Univ., Lafayette, Ind. School of Electrical Engineering.
ADAPTIVE TELEMETRY SYSTEMS.
Final Report, 1 May 1968 - 1 Feb. 1971.
P. A. Wintz. 4 Oct 73, 17p NASA-CR-130228, TR-EE-71-12
Contract NGR-15-005-087

Descriptors: *Abstracts, *Research and development, *Telemetry, Analog data, Bch codes, Data reduction, Digital filters, Error correcting devices, Pulse code modulation.

For abstract, see STAR 1122

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

ANL-8045/GA PC$4.00/MF$1.45
Argonne National Lab., Ill.
SOLAR ENERGY EVALUATION GROUP REPORT.
Aug 73, 50p*
Contract W-31-109-eng-38

Descriptors: (*Solar energy, Utilization).

The report covers a partial review of the status of various phases of solar-energy utilization and of some of the areas of potentially profitable research. The review covers the biological and in vitro aspects of the photochemical conversion of solar energy; the photovoltaic, photothermal, and thermoelectric studies of the physical-conversion process; the use of solar energy for heating and cooling buildings; and finally, the central-station power approach. (Author)

PB-224 146/1GA PC$9.25/MF$1.45
Oregon State Executive Dept., Salem.
OREGON'S ENERGY PERSPECTIVE.
Final rept. Jan-May 73.
May 73, 144p*

Descriptors: (*Energy, Oregon), (*Conservation, Energy), Consumption, Requirements, Sources, Government policies, Steam electric power

generation, Hydroelectric power generation, Natural gas, Crude oil.

The report and accompanying model describe Oregon's energy requirements, sources, distribution, and needs as of May, 1973. Although most of the report applies to Oregon specifically, the recommendations for energy conservation on a statewide basis is applicable nationwide.

PB-224 750/0GA PC$5.00/MF$1.45
Kentucky Univ., Lexington. Coll. of Engineering.
PROCEEDINGS: ENERGY RESOURCE CONFERENCE, OCTOBER 24 AND 25, 1972 (2ND).
Annual rept.
Aug 73, 59p UKY-TR-70-73-CEED4

Descriptors: (*Energy, Meetings), Resources, Oil recovery, Gas production, Conversion, Coal, Coal gasification, Manufactured gas, Synthetic oils, Policies, Natural gas, Transportation.

The proceedings presents the most recent available information on the rapidly changing energy resource picture, fuel policies and consumer demands. Papers by knowledgeable government officials and industrial representatives are included. Topics covered include new developments in the extraction of natural gas and crude oil, interfuel conversion (coal to gas and oil, coal to gas by the Lurgi process, SNG and oil), the role of the federal government to insure an adequate, reliable energy supply, and the transmission and transportation of energy.

SLA-73-5320/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
NEW PARAMETER FOR EVALUATING ENERGY SYSTEMS.
D. O. Lee, and W. H. McCulloch. 1973, 4p CONF-730811-2

Descriptors: (*Energy conversion, *Efficiency), (*Thermodynamic cycles, Efficiency), Availability, Energy, Performance, Thermal efficiency.

For abstract, see NSA 28 07, number 17652.

10B. Power Sources

AD-768 400/4GA PC$5.75/MF$1.45
Defense Documentation Center Alexandria Va
SOLAR CELLS AND SOLAR PANELS.
Report bibliography Oct 58-Feb 73.
Oct 73, 230p* Rept no. DDC-TAS-73-51
Supersedes AD-700 500.

Descriptors: (*Solar panels, *Bibliographies), (*Solar cells, Bibliographies), Power supplies, Silicon, Gallium arsenides, Cadmium sulfides, Films, Semiconducting films, Degradation, Electric power production, Manufacturing methods, Photoelectric cells(Semiconductor), Spaceborne, Spacecraft.
Identifiers: Thin films.

The bibliography is a selection of unclassified and unlimited distribution references on Solar Cells and Solar Panels. These citations of reports present information on performance characteristics, fabrication, development of power levels, degradation studies of solar cells, and systems for orienting solar panels continuously toward the sun. (Author)

AD-768 690/0GA PC$5.50/MF$1.45
Mcdonnell Douglas Astronautics Co Richland Wash Donald W Douglas Labs
PROOF-OF PRINCIPLE INVESTIGATION OF 300 W(E) STIRLING ENGINE PIEZOELECTRIC (STEPZ) GENERATOR.
Final technical rept.,
M. A. White. Sep 73, 216p Rept no. MDC-G4420
Contract DAAK02-71-C-0405

Descriptors: (*Stand-by generators, External combustion engines), Auxiliary power plants, Portable, Piezoelectric crystals, Disks, Generators, Feasibility studies.
Identifiers: *Sterling cycle engines, Life tests.

The objective of the effort was to investigate feasibility of a unique electric power generator. The concept uses pressure pulses generated by a modified Stirling engine to drive a piezoelectric generator. A hydraulic coupler, analogous to the flywheel and mechanical coupling of a conventional engine generator set, is used for optimum coupling between the engine and generator. The final report describes the computer assisted analysis and mechanical design of a proof-of-principle engine-coupler system which will operate into a simulated load. The design approach is concluded to have a high degree of probability for successfully demonstrating the concept. Piezoelectric generator materials were tested at high stress levels to assess the practicability of the generator. Life tests were performed for four piezoelectric stacks with two different surface finishes and ambient temperatures of -25 to +150F. Results showed typically less then 5% performance degradation at peak stress levels near 9000 psi with up to 7.2 x to the 8th power stress cycles accumulated on a single stack. (Modified author abstract)

AEC-tr-7432/GA PC$3.50/MF$1.45
SHORT COURSE ON THERMOELECTRIC DEVICES AND THEIR APPLICATIONS.
N. V Kolomoetz. (nd). 30p
Translation of Lecture Notes.

Descriptors: (*Thermoelectric generators, *Education), Efficiency, Operation, Performance, Uses.

For abstract, see NSA 28 07, number 15417.

CONF-730811-4/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
TECHNOLOGY EVALUATION FOR MIUS.
A. J. Miller, G. Samuels, W. J. Boegly, and L. Breitstein. 1973, 7p

Descriptors: (*Total energy systems, *Planning), Air conditioning, Economics, Energy source conservation, Environment, Fossil fuels, Heating, Pollution, Waste disposal, Water.

For abstract, see NSA 28 07, number 17646.

LA-UR-73-570/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
SOME INTERFACES IN RESOURCE UTILIZATION.
L. P. Reinig. 16p CONF-730440-1
Contract W-7405-eng-36

Descriptors: (*New mexico, *Electric power), (*Geothermal energy, New mexico), (*Brines, *Desalination), Economics, Energy sources, Environment, Fossil fuels, Human populations, Legal aspects, Nuclear power.

For abstract, see NSA 28 07, number 17647.

LA-5295-MS/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
PRELIMINARY STUDY OF OPEN-CYCLE SPACE POWER SYSTEMS.
L. A. Booth, and J. C. Hedstrom. Jun 73, 17p
Contract W-7405-eng-36

Descriptors: (*Open-cycle mhd generators, *Performance), (*Space vehicles, Open-cycle mhd generators), Efficiency, Electric generators, Propulsion reactors, Turbines, Weight.

For abstract, see NSA 28 07, number 15419.

LBL-1773/GA PC$3.75/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
CALCULATIONS ON A SOLAR ENERGY SYSTEM.
R. M. Graven. 8 Mar 73, 33p CONF-731002-1
Contract W-7405-eng-48

Descriptors: (*Buildings, *Solar heating), (*Solar power plants, *Performance), Computer calculations, Computer codes.

For abstract, see NSA 28 08, number 18091.

MDC G-4404/GA PC$5.25/MF$1.45
Mcdonnell Douglas Astronautics CO., Richland, Wash. Donald W. Douglas Labs.
INVESTIGATION OF COMPATIBILITY BARRIERS BETWEEN PLUTONIA-238 AND NOBLE METALS AT 1500 EXP 0 C.
J. D. Watrous, J. C. Walker, and W. E. Ferguson. Apr 73, 64p
Contract AT(45-1)-2138

Descriptors: (*Plutonium oxides, *Compatibility), (*Molybdenum, Compatibility), (*Iridium, Compatibility), (*Hafnium oxides, Compatibility), Capsules, Plutonium 238, Radioisotope heat sources, Thermoelectric generators, Platinum base alloys, Rhodium alloys, Foils, Tungsten alloys, Tantalum base alloys.

For abstract, see NSA 28 08, number 18092.

N-73-17717/GA PC$5.45/MF$1.45
Thermo Electron Corp., Waltham, Mass.
PERFORMANCE TESTS OF A THERMIONIC CONVERTER WITH AN OXYGENATED CESIUM RESERVOIR. FINAL REPORT.
B. Gunther, D. Lieb, T. Pigford, and F. Rufeh. Jul 72, 57p NASA-CR-121119, TE-4144-14-73
Contract NAS3-14413

Descriptors: (*Thermionic converters, *Performance testing), Cesium, Cesium oxides, Solutions.

For abstract, see NSA 28 08, number 18093.

N-73-18571/GA PC$5.45/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
ULTRAVIOLET AND CHARGED-PARTICLE IRRADIATION OF PROPOSED SOLAR CELL COVERSLIDE MATERIALS AND CONDUCTIVE COATINGS FOR THE HELIOS SPACECRAFT.
J. Fry, and C. A. Nicoletta. Jun 72, 112p NASA-TM-X-65945

Descriptors: (*Silicon oxides, *Physical radiation effects), (*Titanium oxides, Physical radiation effects), (*Manganese oxides, Physical radiation effects), (*Indium oxides, Physical radiation effects), Absorption spectra, Coatings, Electric conductivity, Electron beams, Kev range 01-10, Mev range 01-10, Photon beams, Proton beams, Solar cells, Transmission, Ultraviolet radiation.

For abstract, see NSA 28 08, number 18603.

N73-30055/0GA PC$13.75/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
SOLAR CELL RADIATION HANDBOOK.
Final Report.
J. R. Carter, Jr., and H. Y. Tada. 28 Jun 73, 232p NASA-CR-133738, TRW-21945-6001-RU-00
Contracts NAS7-100, JPL-953362
Subm-Prepared for JPL.

Descriptors: *Aerospace environments, *Extraterrestrial radiation, *Radiation effects, *Solar arrays, Electrons, Irradiation, Protons, Radiation damage, Solar flares, Trapped particles.

For abstract, see STAR 1121

N73-30056/8GA PC$5.50/MF$1.45
Pratt and Whitney Aircraft, East Hartford, Conn.
FUEL CELL TECHNOLOGY PROGRAM.
Final Report.
25 Jul 73, 66p NASA-CR-134002, PWA-4756
Contract NAS9-11034

Descriptors: *Fuel cells, *Low temperature, *Potassium hydroxides, Electric power supplies, Electrolytes, Space shuttles.

For abstract, see STAR 1121

N73-30057/6GA PC$9.00/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
SPACE STATION SOLAR ARRAY TECHNOLOGY EVALUATION PROGRAM.
Final Report.
F. V. Bischof. Feb 73, 138p MSC-07163
Contract NAS9-11039

Descriptors: *Solar arrays, *Space stations, *Technology assessment, Engineering drawings, Management planning, Manned space flight.

For abstract, see STAR 1121

N73-30463/6GA PC$7.25/MF$1.45
AiResearch Mfg. Co., Phoenix, Ariz.
PRELIMINARY DESIGN OF A MINI-BRAYTON COMPRESSOR-ALTERNATOR-TURBINE (CAT).
Final Report.
12 Mar 73, 103p NASA-CR-133810, APS-5440-R
Contract NAS3-16739

Descriptors: *Brayton cycle, *Electric equipment, *Gas turbine engines, *Spacecraft power supplies, Equipment specifications, Product development, Systems engineering.

For abstract, see STAR 1121

N73-30976/7GA PC$3.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
PROJECT OF WIND MOTOR WITH AERODYNAMIC TRANSMISSION FOR CAPACITIES OF 100 KW TO 3000 KW.
N. V. Krasovskiy. Sep 73, 21p NASA-TT-F-15131
Contract NASW-2481
Tran-Transl. Into English from Izv. Otd. Tekh. Nauk, Akad. Nauk Sssr (Ussr), No. 5, 1939 p 65-77.

Descriptors: *Electric generators, *Electric power supplies, *Windpowered generators, Electric equipment, Systems analysis, Windmills (Windpowered machines).

For abstract, see STAR 1122

N73-30977/5GA PC$4.25/MF$1.45
Ion Physics Corp., Burlington, Mass.
DEVELOPMENT OF GALLIUM ARSENIDE SOLAR CELLS.
Final Report.
Feb 73, 43p NASA-CR-135510
Contract JPL-953270
Subm-Sponsored by NASA, Prepared by JPL.

Descriptors: *Energy conversion, *Gallium arsenides, *Ion recombination, *Solar cells, Electrical properties, Equipment specifications, Optical properties.

For abstract, see STAR 1122

ORNL-EIS-73-52(Vol.1)(No.6)/GA PC$8.25/MF$1.45
Oak Ridge National Lab., Tenn.
NSF-RANN ENERGY ABSTRACTS. A MONTHLY ABSTRACT JOURNAL OF ENERGY RESEARCH.
M. P. Guthrie. Jun 73, 123p
Contract W-7405-eng-26

Descriptors: (*Energy, *Bibliographies), Economics, Electric power, Energy consumption, Environment, Fuels, Legal aspects, Pollution, Reviews, Transport, Urban populations.

For abstract, see NSA 28 08, number 20541.

ORNL-NSF-EP-39/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn.
SECOND ITERATION ANALYSIS OF A FOSSIL FUEL-FIRED GAS TURBINE-POTASSIUM-STEAM COMBINED CYCLE.
M. E. Lackey. Jul 73, 32p
Contract W-7405-eng-26

Descriptors: (*Combined cycles, *Efficiency), (*Power plants, Efficiency), Economics, Energy, Environment, Fossil fuels, Gas turbines, Heating, High temperature, Potassium, Rankine cycle, Steam, Thermal pollution, Vapors, Very high temperature, Waste heat.

For abstract, see NSA 28 07, number 17648.

ORNL-NSF-EP-51/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn.
RESIDENTIAL CONSUMPTION OF ELECTRICITY: 1950--1970.
J. Tansil. Jul 73, 35p
Contract W-7405-eng-26

Descriptors: (*Energy consumption, *Electric power), Air conditioning, Econometrics, Environment, Heating, Thermal insulation, Urban populations, Usa.

For abstract, see NSA 28 08, number 20542.

ORNL-NSF-EP-53/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn.
ENERGY IMPLICATIONS OF SEVERAL ENVIRONMENTAL QUALITY STRATEGIES.
E. Hirst. Jul 73, 34p
Contract W-7405-eng-26

Descriptors: (*Energy, Environment), (*Environment, *Energy source conservation), Economics, Efficiency, Electric power, Fuels, Human populations, Liquid wastes, Pollution, Transport, Waste disposal, Waste heat, Waste processing.

For abstract, see NSA 28 07, number 17649.

ORNL-NSF-EP-55/GA PC$5.50/MF$1.45
Oak Ridge National Lab., Tenn.
ELECTRICAL ENERGY AND ITS ENVIRONMENTAL IMPACT. PROGRESS REPORT, JUNE 30, 1973.
Jul 73, 67p
Contract W-7405-eng-26

Descriptors: (*Tennessee, Electric power), (*Electric power, Environment), (*Environment, Electric power), (*Coal, *Mining), Air conditioning, Appalachian mountains, Cost, Efficiency, Energy source conservation, Energy source conservation, Food, Human populations, Pollution, Usa.

For abstract, see NSA 28 07, number 17650.

ORNL-TM-4102/GA PC$5.75/MF$1.45
Oak Ridge National Lab., Tenn.
PERFORMANCE OF ALUMINUM SCREEN AND FOIL AS A THERMAL FUSE AND INSULATION FOR ISOTOPE POWER PLANTS.
R. S. Holcomb. Aug 73, 71p
Contract W-7405-eng-26

Descriptors: (*Thermoelectric generators, Radioisotope heat sources), (*Thermal insulation, *Performance testing), (*Radioisotope heat sources, Thermal insulation), Aluminium, Rankine cycle, Very high temperature.

For abstract, see NSA 28 08, number 18094.

PB-224 508/2GA MF$1.45
National Academy of Engineering, Washington, D.C. Committee on Power Plant Siting.
ENGINEERING FOR RESOLUTION OF THE ENERGY-ENVIRONMENT DILEMMA.
Jan 73, 348p*
International Standard Book No. 0-309-01943-5. Library of Congress Catalog Card No. 79-186370. Paper copy available from National Academy of Science Printing and Publishing Office, 2101 Constitution Ave., Washington, D.C. 20418 $10.50.

Descriptors: (*Electric power plants, Planning), (*Environmental engineering, Electric power plants), Site surveys, Pollution, Systems engineering.

The report deals with the urgent nationwide problem of power plant siting, assembling and analyzing material previously unavailable in a single convenient source. The report provides engineers, environmentalists, legislators, and the electric power industry with detailed background information, policy considerations, and conclusions and recommendations for mitigating the conflict between the demands of society for electric energy and its simultaneous desire to preserve the quality of the environment.

SLA-73-5318/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
COMBINATION OF SOLAR ENERGY AND THE TOTAL ENERGY CONCEPT: THE SOLAR COMMUNITY.
R. B. Pope, W. P. Jr. Schimmel, D. O. Lee, W. H. McCulloch, and B. E. Bader. 8p CONF-730811-5

Descriptors: (*Total energy systems, *Planning), (*Solar energy, Planning), Air conditioning, Economics, Electric power, Storage.

For abstract, see NSA 28 07, number 17651.

SLA-73-585/GA PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
PRESPUTTER SURFACE PREPARATION FOR RTG THERMOPILES.
R. K. Traeger, and G. L. Knauss. Jun 73, 27p

Descriptors: (*Thermocouples, *Surface finishing), (*Thermoelectric generators, Thermocouples), Cleaning, Etching, Hydrofluoric acid, Polishing.

For abstract, see NSA 28 08, number 20645.

TID-22659/GA PC$22.50/MF$1.45
Division of Reactor Development and Technology (Aec), Washington, D. C.
PROCEEDINGS OF THE MEETING ON APPLIED THERMIONIC TECHNOLOGY HELD AT ATOMIC ENERGY COMMISSION HEADQUARTERS BUILDING, GERMANTOWN, MARYLAND, MAY 13--14, 1965.
J. M. Prosser. Jan 67, 410p CONF-650586-

Descriptors: (*Thermionic converters, *Meetings), Design, Nuclear fuels, Performance testing, Radioisotope heat sources, Thermionic conversion, Thermionic diodes.

For abstract, see NSA 28 08, number 18095.

UCID-16317/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
SOLAR PONDS EXTENDED.
A. F. Clark. 27 Jul 73, 12p
Contract W-7405-eng-48

Descriptors: (*Solar energy, *Energy storage), (*Water, Energy storage), (*Electric power, Solar energy), Cooling towers, Economics, Efficiency, Thermodynamic cycles, Waste heat.

For abstract, see NSA 28 08, number 20544.

UCRL-51383/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
TWO-ZONE POTENTIAL RELAXATION SCHEME FOR HANDLING GRID WIRES.
R. R. Smith, and S. L. Rompel. 1 Jun 73, 19p
Contract W-7405-eng-48

Descriptors: (*Direct energy converters, *Grids), Electric potential, Electrostatics, Relaxation, Two-dimensional calculations, Wires.

For abstract, see NSA 28 08, number 20655.

10C. Energy Storage

AD-768 500/1GA PC$7.75/MF$1.45
Defense Documentation Center Alexandria Va
BATTERIES.
Report bibliography Jan 67-Apr 73.
Oct 73, 356p* Rept no. DDC-TAS-73-59

Descriptors: (*Batteries + components, *Bibliographies), (*Storage batteries, Bibliographies), Primary cells, Cathodes(Electrolytic cell), Anodes(Electrolytic cell), Alkaline cells, Organic compounds, Power supplies, Electrodes, Electrolytes, Reliability, Battery separators, Water-activated batteries, Spacecraft components, Zinc, Air, Dry cells, Fuel cells, Electrochemistry.
Identifiers: *Nickel cadmium batteries, Nickel zinc cells, *Organic batteries, Zinc air cells.

The bibliography is a selection of unclassified and unlimited citations on Batteries. These references present information on design, cells, test, development, components, and performance characteristics. Discussed are many types of batteries, with most references relating to the nickel cadmium batteries and organic batteries.

AD-768 702/3GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
ALKALINE GALVANIC CELL,
Nikolai Stepanovich Lidorenko, Lidia Fedorovna Penkova, Ivan Ivanovich Koval, Faat Khatovich Nabuillin, and Zoja Mikhailovna Busova. 15 Jan 73, 6p Rept no. FSTC-HT-23-1180-72
Trans. of Patent (West Germany) 1,596,165.

Descriptors: (*Dry cells, *Patents), Primary cells, USSR, West Germany.
Identifiers: Translations.

The invention covers an alkaline galvanic cell of cylindrical shape, having an outer positive electrode, a hollow negative electrode within the former and separated from it by an ion-conductive separator wall, said negative electrode being made of zinc paste, and a tubular current lead for output with friction attachment, fitted within the hollow interior of the negative electrode, electrically connected to the negative current takeoff.

PATENT-3 497 393/GA Not available NTIS
Department of the Navy Washington D C
SEA WATER ACTIVATED BATTERY.
Patent,
Robert H. Dreisbach, Roderick G. Bergstedt, and Dale W. Siegelin. Filed 3 Aug 67, patented 24 Feb 70, 4p Rept nos. PAT-APPL-658 288,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Water-activated batteries, *Patents), Magnesium, Silver compounds, Chlorides.
Identifiers: PAT-CL-136-100.

It is the purpose of this invention to provide a battery which has a long-life operation and a low leakage current and a low internal resistance and which is capable of providing a relatively constant voltage output over its long life. Another object of the invention is to provide a battery wherein the reaction components produced during operation thereof do not interfere with its continuing operation. Yet another object of the invention is to provide a sea water activated battery wherein corrosion of nearby metal parts is reduced. Still another object of the invention is to provide a compact sea water activated battery including an internal volume suitable for receiving electronic components which can be connected to utilize the battery as a power supply.

PATENT-3 518 121/GA Not available NTIS
Department of the Navy Washington D C
NONAQUEOUS AMMONIA PRIMARY CELL UTILIZING NITRATED POLYSTYRENE CATHODE OXIDANT.
Patent,
Charles P. Haver, and Gerald E. McWilliams.
Filed 16 Jul 69, patented 30 Jun 70, 2p Rept nos. PAT-APPL-842363,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Primary cells, *Oxidizers), (*Patents, Primary cells), Ammonium compounds, Sulfates, Styrene plastics, Nitrates, Cathodes.
Identifiers: Styrene/nitro, PAT-CL-136-83, *Ammonia cells.

The present invention provides a cathode oxidant for ammonia batteries which is insoluble in the electrolyte and allows such batteries to last for extended periods of time (e.g. days) at moderate drain rates, unlike m-dinitrobenzene oxidant which is soluble in the electrolyte and limits battery performance to minutes. This invention uses nitrated polystyrenes in a conductive cathode matrix to provide improved primary cells for batteries.

TID-26342/GA PC$7.60/MF$1.45
Dartmouth Coll., Hanover, N. H. Thayer School of Engineering.
SI--AU SCHOTTKY BARRIER NUCLEAR BATTERY.
A. N. Tse. Nov 72, 168p

Descriptors: (*Radioisotope batteries, *Design), (*Cardiac pacemakers, Radioisotope batteries), Economics, Efficiency, Fabrication, Gold, Performance testing, Promethium 147, Radioisotope heat sources, Safety, Schottky effect, Silicon.

For abstract, see NSA 28 07, number 15420.

11. MATERIALS

11A. Adhesives and Seals

N73-31533/5GA PC$8.00/MF$1.45
General Electric Co., Philadelphia, Pa. Re-entry and Environmental Systems Div.
DEVELOPMENT OF HIGH TEMPERATURE SILICONE ADHESIVE FORMULATIONS FOR THERMAL PROTECTION SYSTEM APPLICATIONS.
Final Report, 12 Jan. 1972 - 12 Mar. 1973.
R. R. Hockridge. May 73, 116p NASA-CR-124389
Contract NAS8-28113

Descriptors: *Adhesives, *Silicone resins, *Space shuttles, *Thermal protection, Environmental tests, Low density flow, Polymer physics, Thermodynamic properties.

For abstract, see STAR 1122

PATENT-3 532 180/GA Not available NTIS
Department of the Navy Washington D C
SEMI-FLEXIBLE SEAL FOR CAPTURED AIR BUBBLE VEHICLE.
Patent,
Allen G. Ford, and Robert A. Wilson. Filed 17 May 68, patented 6 Oct 70, 5p Rept nos. PAT-APPL-730 138,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Seals, *Patents), (*Ground effect machines, Seals), Vibration, Drag, Venting, Inflatable structures.
Identifiers: PAT-CL-180-126, *Captured air bubble vehicles.

The patent relates to a method whereby a captured air bubble vehicle is provided with fluid-biased fore and aft semi-flexible seals, each comprised of an upper, relatively rigid panel movable about a transverse axis and a lower relatively flexible panel attached to the upper panel for low drag local compliance with minor surface waves. The local compliance of the lower panel improves roll, heave, yaw and pitch stability of the craft. The coaction of the panels reduces chance of sudden venting of the craft supporting bubble.

PATENT-3 549 155/GA Not available NTIS
Department of the Navy Washington D C
HELICALLY CUT SLEEVE SEAL.
Patent,
John R. Ward. Filed 26 Apr 68, patented 22 Dec 70, 5p Rept nos. PAT-APPL-724 424,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Gas seals, *Patents), Compressor parts, Helixes, Compressors, Cylindrical bodies, Pistons.
Identifiers: PAT-CL-277-116.

The patent describes a sealing system for high pressure air compressor pistons which will not require fluid lubricants. The piston seal comprises a helically cut, hollow cylinder or sleeve which is deformed at one end, to bear against a stationary compressor cylinder.

11B. Ceramics, Refractories, and Glasses

AD-768 789/0GA PC$2.75/MF$1.45
Army Materials and Mechanics Research Center Watertown Mass
INFLUENCE OF SOME SPECIFIC ADDITIVES ON THE STRENGTH OF PRESSURE SINTERED BERYLLIA.
Technical rept.,
Jacob Greenspan. May 73, 14p Rept no. AMMRC-TR-73-25

Descriptors: (*Beryllium oxides, Hot pressing), Additives, Magnesium oxides, Alumina, Silicon carbides, Sintering, Density, Microstructure, Crystal structure, Modulus of elasticity, Flexural strength.
Identifiers: Aluminum oxide.

An exploratory survey was conducted on the influence of some specific additives of MgO, Al2O3, and SiC, to BeO with respect to pressure sintering processing, and with respect to strength development. Highest strengths were represented by BeO-Al2O3 binaries of very fine grain size and dense microstructures. (Author)

AD-768 840/1GA PC$3.00/MF$1.45
Massachusetts Univ Amherst School of Engineering
THE EFFECTS OF MICROSTRUCTURE ON THE FRACTURE ENERGY OF HOT PRESSED MGO,
J. B. Kessler, J. E. Ritter, Jr., and R. W. Rice. Jul 73, 29p Rept no. UM-73-8

Contract N00014-68-A-0146

Descriptors: (*Magnesium oxides, Fracture(Mechanics)), Microstructure, Energy, Grain size, Porosity, Grain boundaries.
Identifiers: Fracture energy.

The work-of-fracture technique was used to investigate the effects of various microstructural parameters on the fracture energy of relatively dense, hot pressed MgO. Grain size, amount and location of porosity, and grain boundary precipitates were the parameters of major interest. The fracture energy measurements were found to be dependent on the microstructure and ranged from 0.47 to 2.7 x 10 to the 4th power ergs/sq cm. Grain boundary precipitates, found in the as hot-pressed samples with LiF additives, weakened intergranular bonding and caused the lowest fracture energies. Limited porosity (up to 1.0%) had only a small effect on the fracture energy when found at the grain boundaries, although this porosity did facilitate intergranular fracture. Porosity found within the grains appeared to promote a tearing between cleavage planes which in turn increased the fracture energy. The effect of grain size on fracture energy was not conclusive, although the percentage of transgranular fracture increased with grain size. These fracture energy values are compared to strength measurements and the limitations of the Griffith equation in explaining the results are discussed. (Author)

COM-73-50851/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
AN EXPERIMENTAL RADIOPAQUE COMPOSITE MATERIAL.
Final rept.,
J. A. Barton, Jr., C. L. Burns, H. H. Chandler, and R. L. Bowen. 1973, 9p
Sponsored in part by American Dental Association, Chicago, National Inst. of Dental Research, Bethesda, Md., Aerospace Medicine, Washington, D.C. Div. of School of Dental Sciences.
Pub. in Jnl. of Dental Research, v52 n4 p731-739 1973.

Descriptors: (*Dental materials, Acrylic resins), (*Acrylic resins, Physical properties), Opacity, Hardness, Solubility, Tensile strength, Compressive strength, Thermal expansion, Hardening(Materials), Absorption, Phthalates, X rays, Water, Composite materials.

Physical properties of a composite material, developed for use as a temporary posterior restorative material, have been investigated. The material is based on isomeric phthalate esters of 2-hydroxyethyl methacrylate and reinforcing fillers consisting of particles of vitreous silica and an X-ray-opaque glass. Properties investigated include hardening time, tensile and compressive strengths, indentation and recovery, hardness, water sorption, solubility, polymerization shrinkage, optical and X-ray opacity, color stability and thermal expansion.

COM-73-50860/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ELECTRICAL CONDUCTIVITY OF COAL SLAG.
Final rept.,
H. P. R. Frederikse, and W. R. Hosler. 1973, 2p
Pub. in Jnl. of the American Ceramic Society, v56 n8 p418-419 Aug 73.

Descriptors: (*Slags, Electrical resistivity), Coal, Electron transfer.

The electrical conductivity of natural and synthetic slags (containing 14 to 36 wt % Fe) was measured from 1200 to 1700 K at O2 pressures from 1 to 2 x 10 to the 6th power atm. The conductivity is relatively high (approximately equal to 0.01 reciprocal ohm cm at 1700 K) and stems from the transfer of electrons between Fe2+ and Fe3+ ions. Anomalies in the conductivity around 1600 K are the result of devitrification of the glass samples.

COO-3344-10/GA PC$5.25/MF$1.45
Massachusetts Inst. Of Tech., Cambridge.
BASIS RESEARCH IN CRYSTALLINE AND NONCRYSTALLINE CERAMIC SYSTEMS. ANNUAL REPORT.
W. D. Kingery, and R. L. Coble. 1973, 65p
Contract AT(11-1)-3344

Descriptors: (*Aluminium oxides, *Crystal defects), Chlorine, Crystal growth, Monocrystals, Uranium dioxide, Vapor plating, Annealing, Glass, High temperature, Microstructure, Temperature dependence, Vycor, Ambipolar diffusion, Damping, Deformation, Grain boundaries, Ceramics, Electric charges, Oxides, Sodium chlorides.

For abstract, see NSA 28 07, number 15843.

COO-3344-9/GA PC$4.75/MF$1.45
Massachusetts Inst. Of Tech., Cambridge.
BASIC RESEARCH IN CRYSTALLINE AND NONCRYSTALLINE CERAMIC SYSTEMS.
W. D. Kingery, and R. L. Coble. 1972, 51p
Contract AT(11-1)-3344

Descriptors: (*Uranium dioxide, *Annealing), Temperature gradients, Crystal growth, Monocrystals, Polycrystals, Solid solutions, Vapor plating, Yttrium oxides, Zirconium oxides, Deposition, Gallium compounds, Phosphides, Surface coating, Vapor deposited coatings, Zinc sulfides, Chemical reactions, Chlorine, Oxygen, Uranium chlorides, Calcium oxides, Diffusion, Measuring methods, Permeability, Cerium oxides, Order-disorder transformations, Vacancies.

For abstract, see NSA 28 07, number 15842.

DP-MS-72-31/GA PC$3.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S. C. Savannah River Lab.
OXIDATION OF SINTERED COBALT OXIDE.
W. R. Ott, and D. T. Rankin. 18 Aug 72, 15p
CONF-720980-2
Contract AT(07-2)-1

Descriptors: (*Cobalt oxides, *Oxidation), (*Magnesium oxides, Oxidation), (*Aluminium oxides, *Corrosion), (*Water, *Corrosive effects), Air, Chemical reaction kinetics, High temperature, Sintered materials, Very high temperature.

For abstract, see NSA 28 08, number 18599.

FRNC-TH-326/GA PC$5.45/MF$1.45
Paris Univ. (France).
MEASUREMENT OF THE THERMAL DIFFUSIVITY OF (U, PU)O SUB 2 OXIDES. STUDIES AS A FUNCTION OF STOICHIOMETRY AND PU CONTENTS.
J. C. Weilbacher. 1972, 111p
In French. U.S. Sales Only.

Descriptors: (*Uranium oxides, *Thermal diffusivity), (*Plutonium oxides, Thermal diffusivity), Binary mixtures, Chemical composition, Quantity ratio, Solid solutions, Stoichiometry, Temperature dependence, Temperature measurement, Thermal conductivity, Vacancies, Very high temperature.

For abstract, see NSA 28 08, number 18600.

N73-30540/1GA PC$4.50/MF$1.45
Washington Univ., Seattle. Ceramic Engineering Div.
INTERDISCIPLINARY RESEARCH CONCERNING THE NATURE AND PROPERTIES OF CERAMIC MATERIALS.
Semiannual Status Report, 16 Dec. 1972 - 15 Jun. 1973.
J. I. Mueller. 15 Jun 73, 50p NASA-CR-133741, SASR-20
Contract NGL-48-002-004

Descriptors: *Ceramics, *Materials tests, *Product development, *Refractory materials, Composite materials, Physical properties, Research projects.

For abstract, see STAR 1121

SLA-73-5049/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
FRACTURE AND STRAIN ENERGY RELEASE IN PRESTRESSED GLASS AND GLASS-CERAMICS.
E. K. Beauchamp. 1973, 11p CONF-730707-1

Descriptors: (*Glass, *Stresses), (*Ceramics, Stresses), Energy, Fractures, Stored energy, Strains.

For abstract, see NSA 28 07, number 17808.

SLL-73-244/GA PC$3.75/MF$1.45
Sandia Labs., Livermore, Calif.
MODEL FOR DESCRIBING DIFFUSION BEHAVIOR OF NA SUB 2 O--SIO SUB 2 GLASS BY A TWO PHASE DIFFUSION MODEL.
S. C. Keeton. Jun 73, 33p
Contract AT(29-1)-789

Descriptors: (*Glass, *Diffusion), (*Silicon oxides, Diffusion), (*Sodium oxides, Diffusion), (*Helium, Diffusion), Mathematical models, Numerical solution, Permeability, Two-dimensional calculations.

For abstract, see NSA 28 07, number 17814.

SLL-73-5258/GA PC$3.50/MF$1.45
Sandia Labs., Livermore, Calif.
EFFECT OF STRUCTURAL RELAXATION ON HELIUM DIFFUSION AND SOLUBILITY IN VITREOUS B SUB 2 O SUB 3 .
J. E. Shelby. Jun 73, 28p CONF-730621-1
Contract AT(29-1)-789

Descriptors: (*Helium, *Diffusion), (*Boron oxides, *Relaxation), Activation energy, Annealing, Medium temperature, Mobility, Solubility, Time dependence, Vitrification.

For abstract, see NSA 28 07, number 15848.

Y-1887/GA PC$4.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
CALCULATED X-RAY DIFFRACTION DATA FOR POLYMORPHIC FORMS OF CARBON.
C. E. Holcombe. 23 Jul 73, 17p
Contract W-7405-eng-26

Descriptors: (*Carbon, *X-ray diffraction), (*Graphite, X-ray diffraction), Atoms, Crystal structure, Layers, Programming.

For abstract, see NSA 28 08, number 20661.

11C. Coating, Colorants, and Finishes

AEEW-R-668/GA PC$3.50/MF$1.45
Atomic Energy Establishment, Winfrith (England).
INVESTIGATION INTO THE EFFECTS OF SURFACE COATINGS ON FORCED CONVECTION BURNOUT WITH FREON-11.
J. H. Kinneir. Feb 70, 26p
U.S. Sales Only.

Descriptors: (*Rods, *Forced convection), (*Textiles, *Burnout), Fluid flow, Freons, Low pressure.

For abstract, see NSA 28 07, number 15432.

BDX-613-865(Rev.)/GA PC$3.00/MF$1.45
Bendix Corp., Kansas City, Mo.
ALUMINUM PLATING GRAPHITE FIBERS AND BERYLLIUM WIRE.
F. A. Clay. Aug 73, 19p
Contract AT(29-1)-613

Descriptors: (*Aluminium, *Deposition), (*Graphite, *Surface coating), (*Beryllium, *Electroplating), (*Composite materials, *Fabrication), Filaments, Vapor deposited coatings, Wires.

For abstract, see NSA 28 08, number 18729.

N73-30506/2GA PC$12.50/MF$1.45
General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
ENRICHED ALUMINIDE COATINGS FOR DISPERSION STRENGTHENED NICKEL MATERIALS.
M. A. Levinstein. Aug 73, 206p NASA-CR-121250
Contract NAS3-14314

Descriptors: *Aluminum compounds, *Nickel alloys, *Protective coatings, Environmental tests, High temperature environments, Oxidation resistance, Precipitation hardening.

For abstract, see STAR 1121

PATENT-3 490 924/GA Not available NTIS
Department of the Navy Washington D C
METHOD OF ELECTROLESS NICKEL PLATING AND PLATING BATHS THEREFOR.
Patent,
Roger A. Manson, and Joseph F. Dytrt. Filed 13 May 66, patented 20 Jan 70, 2p Rept nos. PAT-APPL-551 185,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Electroless plating, *Nickel), (*Patents, Electroless plating), Nickel compounds, Fluoborates, Sodium compounds, Phosphites.
Identifiers: PAT-CL-106-1, Nickel fluoroborate, Baths, Sodium hypophosphite.

The patent describes electroless nickel plating using an aqueous acid plating bath in which a single compound, nickel fluoborate, (NiBF4)2, is the source both of the nickel ions and of the buffer for control of the pH of the bath and sodium hypophosphite is the reducing agent for the nickel ions.

PATENT-3 492 149/GA Not available NTIS
Department of the Navy Washington D C
SURFACE MODIFIED HARD INORGANIC SOLID AND METHOD OF MAKING SAME.
Patent,
William A. Zisman, and Jacques G. Orear. Filed 31 Oct 67, patented 27 Jan 70, 4p Rept nos. PAT-APPL-679 561,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Organic coatings), (*Succinic acids, *Organic coatings), (*Glutaric acids, Organic coatings), Surface properties, Surface tension, Aromatic compounds, Chlorine compounds, Carboxylic acids, Glass, Ceramic materials, Ceramic coatings, Metals, Films, Adsorption, Adhesion.
Identifiers: *Primers(Coatings), PAT-CL-117-75.

The patent describes a primer for hard inorganic solid surfaces which, essentially, is an adsorbed monolayer of a (pchlorophenyl) alkylsuccinic or glutaric acid in which the alkyl group is a straight chain having from 1 to 19 carbon atoms. The film is a coupling agent for promoting bonding of organic coatings to the solids.

PATENT-3 492 150/GA Not available NTIS
Department of the Navy Washington D C
SURFACE MODIFIED HARD INORGANIC SOLID AND METHOD OF MAKING SAME.
Patent,
William A. Zisman, and Jacques G. O'Rear. Filed 31 Oct 67, patented 27 Jan 70, 3p Rept nos. PAT-APPL-679 562,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Organic coatings), (*Carboxylic acids, *Organic coatings), Glass, Films, Surface properties, Surface tension, Adsorption, Metals, Ceramic materials, Ceramic coatings, Chlorine compounds, Aromatic compounds, Adhesion.
Identifiers: *Primers(Coatings), PAT-CL-117-75.

The patent describes a primer for hard inorganic solid surfaces which, essentially, is monolayer of an omega(p-chlorophenyl) alkanoic acid of the general formula: p-ClC6H4(CH2)n COOH in which n=1 to 19. The film is a coupling agent for promoting bonding of organic coatings to the solids.

PATENT-3 533 897/GA Not available NTIS
Department of the Navy Washington D C
OPTICALLY CLEAR ROUGHENED GLASS AND METHOD FOR MAKING SAME.
Patent,
Roland W. Robbins, Jr., and Stewart L. Thorne. Filed 19 Jun 67, patented 13 Oct 70, 3p Rept nos. PAT-APPL-647 888,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Optical coatings, *Patents), Glass, Plastic coatings, Epoxy plastics, Polyester plastics, Protective treatments, Bonding.
Identifiers: PAT-CL-161-117.

The patent describes a method for making roughened glass surfaces optically clear and at the same time providing a protective covering to the surface. This method comprises cementing a preformed optically clear plastic sheet to a glass surface thereby avoiding expensive and time-consuming grinding and polishing processes.

PATENT-3 745 082/GA Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SEMICONDUCTOR SURFACE PROTECTION MATERIAL.
Patent.
R. D. Packard. Patented 10 Jul 73, 3p NASA-CASE-ERC-10339-1,
Misc-Filed 5 Jun. 1970 Supersedes N70-36075 (08 - 19, p 3563).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *P-n junctions, *Protective coatings, *Resins, *Semiconductor junctions, Casting, Patents, Room temperature, Surface finishing.

A method and a product for protecting semiconductor surfaces is disclosed. The protective coating material is prepared by heating a suitable protective resin with an organic solvent which is solid at room temperature and converting the resulting solution into sheets by a conventional casting operation. Pieces of such sheets of suitable shape and thickness are placed on the semiconductor areas to be coated and heat and vacuum are then applied to melt the sheet and to drive off the solvent and cure the resin. A uniform adherent coating, free of bubbles and other defects, is thus obtained exactly where it is desired.

PB-224 654/4GA PC$3.00/MF$1.45
National Bureau of Standards, Washington, D.C.
PILOT DEMONSTRATION OF LEAD BASED PAINT HAZARD ELIMINATION METHODS. REPORT ON FIELD STUDY NO. 1.
Final rept.,
Thomas H. Boone, Theodore R. Ray, and William G. Street. Jun 73, 36p* NBSIR-73-242

Descriptors: (*Lead coatings, Elimination), Paints, Hazards, Cost analysis, Performance evaluation, Paint removers, Labor estimates, Scrapers, Membranes, Jute, Lead poisoning, Surface finishing, Protective coatings, Residential buildings, Vinyl coatings.
Identifiers: *Lead based paints.

The report describes the elimination of the hazard of lead bearing paints in a one bedroom apartment using materials and procedures that are undergoing laboratory and field evaluation by the National Bureau of Standards (NBS). Paint removal was used to eliminate the hazard from some surfaces and two nonhazardous membrane type coverings were installed as barrier materials over the residual leaded paint on other surfaces. The preparation and refinishing of the interior surfaces are described and work rates and cost data are presented.

11D. Composite Materials

AD-768 395/6GA PC$3.00/MF$1.45
Pittsburgh Univ Pa Dept of Metallurgical and Materials Engineering
STRUCTURE AND PROPERTIES OF MELT GROWN NB-NB2C COMPOSITES.
Technical rept.,
Stan A. David, and Harold D. Brody. 1 Sep 73, 41p* Rept no. MME-HDB-73-R1
Contract N00014-67-A-0402-0003

Descriptors: (*Composite materials, *Eutectics), Zone melting, Niobium, Niobium compounds, Carbides, Fiber metallurgy, Freezing, Microstructure, Interfaces.
Identifiers: *Eutectic composites, Niobium carbides, Niobium matrix composites.

The report consists of two preprints. One preprint describes a process for growing eutectic and hypereutectic Nb-Nb2C composites by an electron beam floating zone freezing technique. The structure is characterized as a function of carbon content and growth rate. The conditions for interface stability in the Nb-Nb2C system are compared to present theoretical models. The second preprint discusses sources of banding in composite growth and pays particular attention to banding that results from nonuniformity in the feed rod. This mechanism is important in composite growth techniques employing zone melting and may be avoided by zone levelling prior to composite growth. (Author)

AD-768 408/7GA PC$3.00/MF$1.45
Tel-Aviv Univ (Israel) School of Engineering
SOME EFFECTS OF FIBER WABBLINESS IN COMPOSITE PLATES.
Final rept. (Part 1),
Y. Benveniste, and Y. Weitsman. Apr 73, 46p
ARDG(E)-E-1450
Contract DAJA37-73-C-0400

Descriptors: (*Composite materials, Stresses), Fibers, Alignment, Distortion, Panels(Structural), Israel.
Identifiers: Plates(Structural members).

The paper concerns the effects that slight deviations in fiber directions have on the stress field in composite plates. The fiber reinforced plates are represented by the equivalent modulus theory as homogeneous transversely isotropic regions and the deviations in fiber directions are incorporated by varying the directions of the axes of the material symmetry. Solutions are presented to three specific boundary value problems. In two of those problems, comparison is provided with results

derived under the assumption of fiber inextensibility. It is shown that, for the problems considered, the model of inextensible fibers yields very satisfactory answers. Furthermore, it is found that when the misalignments in fiber directions are localized within a small region of the plate, they give rise to secondary stresses whose amplitude is much higher than the magnitudes of the secondary stresses associated with widely spread misalignments. (Author)

AD-768 453/3GA PC$4.75/MF$1.45
Battelle Columbus Labs Ohio
ANALYTICAL INVESTIGATION OF STRESS CONCENTRATIONS DUE TO HOLES IN FIBER REINFORCED PLASTIC LAMINATED PLATES, THREE-DIMENSIONAL MODELS.
Technical rept. 15 Jan 72-15 Jan 73,
Edmund F. Rybicki, and Allen T. Hopper. Mar 73, 53p AFML-TR-73-100
Contract F33615-72-C-1239

Descriptors: (*Laminated plastics, Stresses), Reinforced plastics, Epoxy plastics, Shear stresses, Boundary value problems, Fatigue(Mechanics), Numerical analysis, Orifices, Panels(Structural).
Identifiers: Stress concentration, Finite element analysis, Fiber laminates, Plates(Structural members).

A three-dimensional analysis for the stress distributions around a hole in a laminated plate is presented. The method of stress analysis is based on a complementary energy formulation with three-dimensional equilibrium finite elements. Three Maxwell stress functions are associated with each element. Finite element representations for the stress functions include positive and negative powers of the radial coordinate, r. This representation was found to give better stress solutions than the conventional representations with only positive powers of r. Numerical verification checks of the analysis for two-dimensional problems are presented. Three-dimensional finite element solutions are presented for four- and six-layered plates with symmetric lay-up angles. Material properties representing boron/epoxy laminas are used. Problems are selected to show the influence of laminate stacking sequence on the transverse normal and shear stresses around the hole. Stresses obtained from two-dimensional effective modulus representations are compared with three-dimensional results. (Author)

AD-768 581/1GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Metallurgy and Materials Science
THE EFFECT OF BRITTLE INTERFACIAL COMPOUNDS ON DEFORMATION AND FRACTURE OF MOLYBDENUM-ALUMINUM FIBER COMPOSITES,
P. W. Heitman, L. A. Shepard, and T. H. Courtney. 5 Sep 72, 24p
Contract F44620-70-C-0020
Prepared in cooperation with General Motors Corp., Indianapolis, Ind. and Texas Univ., Austin.
Availability: Pub. in Jnl. of the Mechanics and Physics of Solids, v21 p75-89 1973.

Descriptors: (*Composite materials, Intermetallic compounds), Aluminum alloys, Molybdenum alloys, Interfaces, Fibers, Brittleness, Deformation, Fracture(Mechanics), Molybdenum, Wire.
Identifiers: *Fiber composites, Aluminum matrix composites.

The effect of brittle intermetallic compounds at the fiber-matrix interface on the deformation characteristics of molybdenum-aluminum fiber composites was investigated. If the filament is ductile and notch-insensitive, then composite strength degradation is relatively minor and composite strength can be predicted by a modified mixture-rule which neglects the strength contribution of the brittle compound. For the case of notch-sensitive filaments, severe filament degradation occurs upon compound formation. The degradation was shown to result from cracks formed during deformation at the roots of compound nodules. The presence of 10 per cent compound by volume results in a 50 per cent decrease in tensile strength, but larger amounts of compound cause little additional strength reduction. At filament volume fractions of 25 and 34 per cent and compound volume fractions less than 10 per cent, composite fracture occurs by the statistical accumulation of fiber necks or fractures depending on the notch sensitivity of the fiber. At high fiber or compound volume fractions, composite failure occurs upon the first or the second filament fracture. (Author)

AD-768 614/0GA PC$4.00/MF$1.45
Virginia Polytechnic Inst and State Univ Blacksburg Coll of Engineering
EFFECTS OF CYCLIC FREQUENCY ON THE MECHANICAL PROPERTIES OF COMPOSITE MATERIALS.
Interim technical rept.,
Wayne W. Stinchcomb, Kenneth L. Reifsnider, Larry A. Marcus, and Richard S. Williams. Jun 73, 38p Rept no. VPI-E-73-25 AFOSR-TR-73-1907
Grant AF-AFOSR-2358-72

Descriptors: (*Composite materials, Fatigue(Mechanics)), Boron, Aluminum alloys, Epoxy plastics, Laminates, Frequency, Acoustic properties, Damping.
Identifiers: Acoustic emission, Aluminum matrix composites, Epoxy matrix composites, Boron reinforced composites, Oriented fiber composites, Fatigue tests.

Strain controlled cyclic stress-strain and fatigue tests were conducted on specimens of boron-epoxy and boron-aluminum at cyclic frequencies between 0.5 Hz and 45 Hz. The specimens were cross-ply laminates with a (0 degree, plus or minus 45 degree, 0 degree)s fiber orientation and had a 0.25 in. hole in the center. The results of data obtained from both types of tests showed the response of the material to be frequency and cycle dependent. The marked difference in behavior of the material at 15 Hz and 30 Hz suggests the presence of a transition frequency (or frequency range) at which the properties of the material are greatly influenced by frequency controlled mechanisms. At a given frequency, changes in properties occur with increasing cycles and correlate with acoustic emissions monitored during the test. (Author)

AD-768 636/3GA PC$4.75/MF$1.45
Massachusetts Inst of Tech Cambridge Aeroelastic and Structures Research Lab
THE STRESS INTENSITY OF A CRACK AT AN INTERFACE BETWEEN TWO MATERIALS.
Interim rept.,
Kuen-Yuan Lin. Jun 73, 54p Rept no. ASRL-TR-162-5 AFOSR-TR-73-1917
Contract F44620-70-C-0020

Descriptors: (*Composite materials, Stresses), (*Fracture(Mechanics), Stresses), Cracks, Interfaces.
Identifiers: Finite element analysis.

An understanding of the stress distributions in the inhomogeneous fiber/matrix interface regions is required to predict crack extension behavior in composite structures. The stress singularity at the tip of a crack, either lying along or perpendicular to the interface of the two materials, is first investigated by the complex variable method. The order of the singularity is shown to be dependent on both the crack geometry and two parameters alpha, beta which are related to the four elastic constants of the two materials. A hybrid crack element is constructed to properly account for the cracks in different bimaterial continua are then calculated using the finite element method. (Modified author abstract)

AD-769 007/6GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
ELASTIC BEHAVIOR OF COMPOSITE MEDIA,
Joseph E. Flaherty, and Joseph B. Keller. Apr 73, 16p
Grant AF-AFOSR-2107-71
Prepared in cooperation with Rensselaer Polytechnic Inst., Troy, N.Y.
Availability: Pub. in Communications on Pure and Applied Mathematics, v26 p565-580 1973.

Descriptors: (*Composite materials, *Elasticity), Shear stresses, Deformation, Numerical analysis.

The authors obtained three kinds of theoretical results concerning the behavior of a composite elastic medium consisting of a matrix containing identical parallel cylindrical fibers or holes arranged in a rectangular lattice. The first, an exact result, is a theorem relating the effective yz shear modulus of a composite to the effective xz shear modulus of the composite obtained by interchanging the fiber and matrix materials. The second are asymptotic results for the effective moduli of, and maximum stress in, a composite with closely spaced rigid fibers or holes. The third set of results are numerical finite difference calculations of the displacements and stresses in a composite containing a square array of rigid circular cylinders.

N73-30519/5GA PC$5.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany).
DIRECTIONALLY SOLIDIFIED CO-CR-C-COMPOSITES. MICROSTRUCTURE AND STRENGTH BETWEEN 20 AND 1050 C OBTAINED BY DIFFERENT SOLIDIFICATION MODES.
K. Fritscher, G. Wirth, and W. Bunk. 23 Jan 73, 56p DLR-FB-73-37
In German; English Summary.

Descriptors: *Carbon fibers, *Chromium alloys, *Cobalt alloys, *Microstructure, *Nickel alloys, *Solidification, Composite materials, Eutectic alloys, Tensile strength, Ternary systems, Thermal resistance.

For abstract, see STAR 1121

N73-30533/6GA PC$3.00/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
THE FABRICATION AND PROPERTIES OF CARBON FIBRE REINFORCED GLASS COMPOSITES.
E. J. Lumley. Nov 72, 14p ARL/MET-NOTE-85

Descriptors: *Carbon fibers, *Composite materials, *Glass fibers, *Hot pressing, Materials tests, Mechanical properties, Physical properties.

For abstract, see STAR 1121

N73-30537/7GA PC$6.00/MF$1.45
Case Western Reserve Univ., Cleveland, Ohio.
THE EFFECT OF THERMAL CYCLING ON THE STRUCTURE AND PROPERTIES OF A CO, CR, NI-TAC DIRECTIONALLY SOLIDIFIED EUTECTIC COMPOSITE.
F. M. Dunlevey, and J. F. Wallace. 1 Sep 73, 79p
NASA-CR-121249
Contract NGR-36-027-035

Descriptors: *Creep rupture strength, *Eutectic alloys, *Microstructure, *Solid phases, Materials tests, Mechanical properties, Thermophysical properties.

For abstract, see STAR 1121

N73-30539/3GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

OXIDATION RESISTANCE OF SELECTED MECHANICAL CARBONS AT 650 DEG C IN DRY FLOWING AIR.
G. P. Allen, and D. W. Wisander. Sep 73, 18p
NASA-TN-D-7381, E-7033

Descriptors: *Air flow, *Carbon, *Oxidation resistance, Carbon compounds, Pitch (Material), Zinc compounds.

For abstract, see STAR 1121

N73-30541/9GA PC$11.00/MF$1.45
Tennessee Univ., Tullahoma. Space Inst.
THE EFFECTS OF ELEVATED TEMPERATURES ON THE STRUCTURAL PROPERTIES OF FIBER COMPOSITE MATERIALS SUITABLE FOR USE IN SPACE SHUTTLE AND OTHER SPACE VEHICLES.
Final Report, 1 Jul. 1971 - 15 Oct. 1972.
M. A. Wright. Oct 72, 177p NASA-CR-124369

Descriptors: *Aluminum alloys, *Boron, *Composite materials, *Spacecraft construction materials, *Thermal stresses, Cyclic loads, High temperature environments, Materials tests, Thermophysical properties.

For abstract, see STAR 1121

N73-30542/7GA PC$3.25/MF$1.45
General Dynamics/Convair, San Diego, Calif. Aerospace Div.
PREPARATION OF COMPOSITE MATERIALS IN SPACE. VOLUME 1: EXECUTIVE SUMMARY.
Final Report.
W. H. Steurer, and S. Kaye. Jan 73, 25p NASA-CR-124365, GDCA-DBG73-001-VOL-1
Contract NAS8-27806

Descriptors: *Composite materials, *Space manufacturing, Aerospace environments, Fluid mechanics, Reinforcing fibers.

For abstract, see STAR 1121

N73-30546/8GA PC$5.50/MF$1.45
Royal Netherlands Aircraft Factories Fokker, Amsterdam. Manufacturing Research and Product Development Dept.
INVESTIGATION OF THE INFLUENCE OF OUTDOOR WEATHERING ON THE MECHANICAL PROPERTIES AND THE QUALITY OF APPEARANCE OF SEVERAL GLASSCLOTH REINFORCED THERMOSETTING RESIN LAMINATES.
Interim Report.
R. Scheltes. 6 Mar 73, 70p FOK-R-1627

Descriptors: *Laminates, *Mechanical properties, *Surface properties, *Thermosetting resins, *Weathering, Epoxy resins, Fokker aircraft, Glass, Long term effects, Polyester resins, Reinforcement (Structures), Tensile tests.

For abstract, see STAR 1121

N73-31532/7GA PC$7.25/MF$1.45
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif. Research and Engineering Dept.
DEVELOPMENT OF ADVANCED MATERIALS COMPOSITES FOR USE AS INSULATIONS FOR LH2 TANKS.
Final Report, May 1972 - Apr. 1973.
C. R. Lemons, and O. K. Salmassy. Apr 73, 101p
NASA-CR-124388, MDC-G4492
Contract NAS8-25973

Descriptors: *Composite materials, *Liquid hydrogen, *Propellant tanks, *Space shuttles, *Thermal insulation, Glass fibers, Polyurethane foam, Production engineering, Reinforcing fibers.

For abstract, see STAR 1122

N73-31536/8GA PC$3.50/MF$1.45
Aeronautical Quality Assurance Directorate, Uxbridge (England).
METHODS OF MEASUREMENT OF THE RELATIVE PERFORMANCE OF VARIOUS CLASSES OF RESINS IN CARBON FIBRE COMPOSITES.
L. J. Artis, and J. C. Joiner. 1 Oct 72, 29p
AQD/NM-000198, BR-34371

Descriptors: *Carbon fibers, *Composite materials, *Resins, *Shear strength, *Tensile strength, Flexibility, Phenolic resins, Polyester resins, Polyimide resins, Radiography.

For abstract, see STAR 1122

PATENT-3 544 421/GA Not available NTIS
Department of the Navy Washington D C
FILAMENT WOUND STRUCTURAL LAMINATES.
Patent,
James R. Griffith. Filed 31 May 67, patented 1 Dec 70, 4p Rept nos. PAT-APPL-643 321,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Filament wound construction, *Barrier coatings), (*Patents, Filament wound construction), Amides, Laminated glass, Impregnation.
Identifiers: PAT-CL-161-144, Decane diamides.

The invention relates to improved filament-wound structural laminates in which the filament windings are bonded with cured epoxy resins. It also relates to a method of impregnating continuous strands of high modulus, nonmetallic inorganic filaments with high molecular weight, flexible, thermoplastic organic polymers. Filament-wound glass fiber structural laminates in which the binder is a cured epoxy resin have low stress distribution due to the hard nature of the cured resin. It is a particular object to provide improved stress distribution in filament-wound structural laminates of glass or other high modulus, nonmetallic, inorganic filament windings which are bonded with cured epoxy resins through the inclusion therein of a tough, flexible plastic which encapsulates the filaments and intervenes between the filaments and the cured epoxy resin binder.

SLA-73-707/GA PC$3.50/MF$1.45
Sandia Labs., Livermore, Calif.
EFFECTS OF FILAMENT ORIENTATION AND SPECIMEN THICKNESS ON THE STATIC FRACTURE TOUGHNESS OF CVD/FW CARBON--CARBON COMPOSITES.
T. R. Guess. Jul 73, 28p

Descriptors: (*Carbon, *Fracture properties), (*Filaments, Fracture properties), (*Composite materials, Fracture properties), Failures, Orientation, Thickness.

For abstract, see NSA 28 08, number 18897.

UCRL-73057/GA PC$3.25/MF$1.45
California Univ., Livermore. Lawrence Radiation Lab.
SIMPLE CONSTITUTIVE RELATION FOR POROUS MATERIALS.
A. C. Holt, M. Carroll, and A. Kusubov. 1 Mar 71, 23p

Descriptors: (*Composite materials, *Porosity), Finite difference method, Mathematical models, Pressure gradients, Stresses, Thermodynamic properties, Wave propagation.

For abstract, see NSA 28 08, number 20656.

11E. Fibers and Textiles

AD-768 447/5GA PC$3.00/MF$1.45
Little (Arthur D) Inc Cambridge Mass
GROWTH OF TITANIUM AND CHROMIUM STRENGTHENED SAPPHIRE FIBERS.
Final rept. May-Nov 72,
J. S. Haggerty. 22 Jan 73, 15p AFML-TR-73-2
Contract F33615-72-C-1956

Descriptors: (*Fibers, Alumina), Sapphires, Ruby, Doping, Titanium, Chromium, Filaments, Reinforcing materials, Ceramic fibers, Tensile properties, Zone melting.

Pore-free Ti(+3) and Cr(+3) doped Al2O3 fibers were grown by the Arthur D. Little fiber growth process. The absence of surface and bulk defects in these fibers resulted in higher virgin and abraded room temperature strengths than comparable fibers produced by another process. Solution hardening by Cr(+3) doping resulted in improved high temperature tensile strengths. The high temperature strength increase with a Cr content, so further improvements are probable with higher doping levels. (Author)

AD-768 766/8GA PC$2.75/MF$1.45
Army Natick Labs Mass Clothing and Personal Life Support Equipment Lab
SCANNING ELECTRON MICROSCOPY AS RELATED TO THE STUDY OF HIGH-SPEED FIBER IMPACT.
Final technical rept.,
Roy C. Laible, Frank Figucia, and Barbara Kirkwood. Oct 73, 22p Rept no. C/PLSEL-114
USA-NLABS-TR-73-58-CE

Descriptors: (*Polyamide plastics, *Fracture(Mechanics)), (*Nylon, Fracture(Mechanics)), Fibers(Synthetic), Aromatic compounds, Aliphatic compounds, Ballistics, Laminated plastics, Elasticity, Tensile properties, Melting point, Elongation, Crystal structure, Tires, Impact.
Identifiers: Scanning electron microscopy, Nylon 6, Nylon 66, Tire cords, Plastic deformation.

Aliphatic polyamide fibers of the nylon 6 and nylon 6,6 type have been important materials for many industrial and military applications. New aromatic polyamides have become available which have advantages over the aliphatic polyamides such as higher melting points, higher moduli and higher strengths. These aromatic polyamide fibers fracture quite differently than aliphatic nylon fibers and the investigation of the fracture process is most conveniently conducted by the use of scanning electron microscopy. The potential for high strength in these new aromatic polymers is probably due to extended polymer chains which are broken more nearly in unison during extension. However, the realization of these high strengths with such low elongation fibers depends upon the process of fibrillation to prevent premature catastrophic failure. The strength of the aromatic polyamide 'Fiber B' is contrasted with the strongest nylon tire cord previously available and for the theoretical value calculated on the basis of all primary bonds breaking at once.

AD-768 767/6GA PC$3.00/MF$1.45
Army Natick Labs Mass Clothing and Personal Life Support Equipment Lab
ELECTROSTATIC PHENOMENA IN TEXTILE, AND CLOTHING SYSTEMS.
Technical rept.,
Frank J. Rizzo. Oct 73, 45p* Rept no. C/PLSEL-111 USA-NLABS-TR-74-2-CE

Descriptors: (*Textiles, *Electrostatic fields), (*Clothing, Electrostatic fields), Reviews, Fibers, Metallic textiles, Finishes + finishing, Test methods, Electrostatics, Humidity, Polymers.

Contents:
General characteristics of electrostatic phenomenon;
Understanding static electrification;
Methods of control of static charge (Fiber blends, Antistatic finishes, Admixtures of conducting metallic fibers, Polymer

modification by grafting to achieve static dissipation);
Testing for static propensity (General considerations, Laboratory methods for assessing static propensity of materials, Materials-clothing-man-environment interactions);
Implications of fabric electrostatic properties on the materials-clothing-man system performance.

AD-769 055/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A METHOD OF PRODUCING CARBON FIBER,
Ya. A. Satunovskii. 17 Oct 73, 6p Rept no. FTD-HT-23-616-74
Edited trans. of Patent (USSR) 168 848 p1-2 1965, by Ray E. Zarza.

Descriptors: (*Carbon fibers, Manufacturing methods), Pitch(Material), Heat treatment, Coal tar, Additives, Patents, USSR.
Identifiers: Translations, Roasting.

A method of producing carbon fiber by electric calcination or cracking at a high temperature of the carbonaceous materials, is distinguished by the fact that for the purpose of extending the base and reducing the cost of the raw materials, various carbonaceous materials existing in the plastic state, and possessing the necessary viscosity in this case, or those that are transitional during heat treatment through the plastic state, are used, as for example, pitches, resins, tars, bitumens, asphalts. The method is distinguished by the fact that added to the composition of the carbonaceous materials, for example, are sulfur, acid tar, phenol and aniline.

PATENT-3 489 591/GA Not available NTIS
Department of the Navy Washington D C
METHOD OF MAKING RADIATION RESISTANT FABRIC.
Patent,
Nathan F. Cardarelli. Filed 16 Feb 67, patented 13 Jan 70, 1p Rept nos. PAT-APPL-617 766,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Protective clothing, *Nuclear radiation), (*Patents, Protective clothing), Coatings, Lanthanum compounds, Oxides, Fluorine compounds, Polyethylene plastics, Textiles.
Identifiers: PAT-CL-117-66, *Radiation shielding, Ethylene/tetra fluoro, Lanthanum oxides.

The present invention relates to an improved method of making a radiation resistant material by coating a fiber prior to weaving said fiber into a fabric. The fiber is coated by dipping into a mixture of lanthanum oxide, polytetrafluoroethylene and distilled water. The coated fiber is then dried in an air oven at an elevated temperature and, after drying, the fiber is woven into a finished fabric.

PATENT-3 533 870/GA Not available NTIS
Department of the Navy Washington D C
METHOD OF FABRICATING A FLEXIBLE IMPREGNATED GLASS FIBER TETHER HAVING MAXIMUM STRENGTH PROPERTIES.
Patent,
John M. Mackay, and Robert B. McKee, Jr. Filed 21 Jul 66, patented 13 Oct 70, 4p Rept nos. PAT-APPL-566 954,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Glass textiles, *Patents), Cordage, Impregnation, Thermosetting plastics, Tensile properties, Manufacturing methods.
Identifiers: PAT-CL-156-180.

The patent relates to a new and improved method and apparatus for fabricating a continuous flexible glass tether having a maximum diameter of 0.085 in. and a minimum break strength of 1500 pounds.

UCID-16269/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
MICROSTRUCTURE CHARACTERIZATION OF AN ORGANIC FIBER.
J. E. Hanafee. 25 May 73, 14p
Contract W-7405-Eng-48

Descriptors: (*Filaments, *Failures), (*Composite materials, Failures), (*Pressure vessels, Failures), Fractures, Microstructure.

For abstract, see NSA 28 07, number 17820.

11F. Metallurgy and Metallography

AD-768 404/6GA PC$3.25/MF$1.45
Rutgers - the State Univ New Brunswick N J Materials Research Lab
MICROSTRUCTURE AND PHASE RELATIONS FOR TI-MO-AL ALLOYS.
Technical rept. 1 Oct 70-30 Sep 71,
T. Hamajima, G. Lutjering, and S. Weissmann.
Nov 71, 22p AFML-TR-71-236
Contract F33615-69-C-1322

Descriptors: (*Titanium alloys, Phase studies), Molybdenum alloys, Aluminum alloys, Microstructure, Thermal stability, Diffusion.
Identifiers: Titanium alloy 7Al 7Mo, Titanium alloy 16Al 7Mo.

The influence of aluminum additions to a titanium-7 at % molybdenum alloy on the phase equilibria was investigated. The microstructures of the alloys, Ti-7% Mo-7% Al, and Ti-7% Mo-16% Al, were determined by light and electron microscopy. It was found that with increasing aluminum concentration the formation of the metastable omega phase was suppressed. In the Ti-7% Mo-16% Al alloy the beta phase decomposed upon quenching by precipitating coherent, ordered particles having a CsCl type of crystal structure (beta sub 2). At low temperatures the equilibrium phases for this alloy were beta + alpha + beta sub 2, whereas at high temperature (850C-950C) the Ti3Al phase was in two-phase equilibrium with the beta phase. The four-phase equilibrium which exists at a temperature of about 550C involves the reaction beta + Ti3Al reversibly yield alpha + beta sub 2. (Author)

AD-768 427/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STUDY OF PHASE EQUILIBRIUM OF ALLOYS OF THE TI-AL-NB TERNARY SYSTEM,
T. T. Nartova, and G. G. Sopochkin. 28 Sep 73, 12p Rept no. FTD-HT-23-120-74
Edited trans. of mono. Novyi Konstruktsionny Material-Titan, n.p. 1972 p19-23, by Kathleen L. Dion.

Descriptors: (*Titanium alloys, *Phase studies), (*Aluminum alloys, Phase studies), (*Niobium alloys, Phase studies), Titanium compounds, Aluminum compounds, Intermetallic compounds, USSR.
Identifiers: Translations.

Results of studying the phase equilibrium of alloys in the Ti-Ti3Al-Nb system have shown the regions of stable alpha- and beta-ternary solid solutions with the joint alloying of titanium by aluminum and niobium, and also has established the limit concentrations of niobium when it is alloyed by the compound Ti3Al (5-6% Nb).

AD-768 428/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PHASE AND STRUCTURAL CHANGES IN TITANIUM UNDER PULSE LOADINGS,
I. O. Pashkov, B. E. Gokhstein, and I. I. Polyskova. 11 Oct 73, 11p Rept no. FTD-HT-23-129-74
Edited trans. of mono. Novyi Konstruktsionny Material--Titan n.p.

Descriptors: (*Titanium, *Phase studies), Impact shock, Defects(Materials), Temperature, USSR.
Identifiers: Translations.

The presence of phase transition under an applied dynamic pressure similar to the (alpha to omega) phase transition realized with a static load was established. A methodology was worked out for fixing the high-temperature phase in pure titanium using pre-freezing in liquid nitrogen and an applied dynamic pressure produced by intense shock waves. A probable mechanism for observing the formation and fixing of the (beta)-phase in titanium was proposed. The described methodology for fixation can be used when studying the high-temperature phases of other pure metals.

AD-768 429/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STUDY OF THE EFFECT OF CERTAIN ELEMENTS ON THE HEAT RESISTANCE OF TITANIUM ALUMINADE TI3AL,
O. N. Andreev, and I. I. Kornilov. 28 Sep 73, 10p Rept no. FTD-HT-23-136-74
Edited trans. of mono. Novyi Konstruktsionny Material--Titan, n.p. 1972 p101-104, by Victor Mesenzeff.

Descriptors: (*Titanium compounds, High-temperature research), (*Aluminum compounds, High-temperature research), Additives, Zirconium, Hafnium, Vanadium, Niobium, Tantalum, Chromium, Molybdenum, Tungsten, Manganese, Iron, Cobalt, Nickel, Carbon, Silicon, Germanium, Tin, Lead, Titanium alloys, Aluminum alloys, Creep, USSR.
Identifiers: Translations, Thermal resistance, Titanium intermetallics.

Using a centrifugal method of bending, a change in the heat resistance of the Ti3Al compound was studied as a function of its alloying with one atomic percent with elements of group 4-8 and 4-B of the periodic system: Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Fe, Co, Ni, C, Si, Ge, Sn, and Pb. It is established that with an increase in the atomic number of an element the heat resistance within each group is increased. Alloying the Ti3Al with vanadium or molybdenum considerably increases the deformation property of alloys at high temperatures. Alloys based on titanium aluminide Ti3Al alloyed with one atomic percent W, Sn, Mo, Hf, Si, Zr, Ta, Nb, and V have the greatest heat resistance at 750C and stress of 25 kgf/sq. mm.

AD-768 430/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
FEATURES OF THE EFFECT OF ALUMINUM ON MECHANICAL PROPERTIES OF TITANIUM,
L. S. Moroz, I. N. Razuvaeva, and S. S. Ushkov. 28 Sep 73, 15p Rept no. FTD-HT-23-138-74
Edited trans. of mono. Novyi Konstruktsionny Material-Titan, n.p. 1972 p109-114, by Kathleen L. Dion.

Descriptors: (*Titanium alloys, Mechanical properties), Aluminum alloys, Phase studies, Plasticity, Yield point, Resistance(Electrical), USSR.
Identifiers: Translations.

The significant change in mechanical properties of the titanium and alpha-alloys upon the introduction of aluminum evidently occurs not only

because of the elastic distortions introduced by the aluminum atoms in the titanium lattice, but also because of the appearance of a second phase. The heterogeneity of the aluminum distribution turns out to be very stable and is not removed during prolonged homogenizing annealing.

AD-768 431/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
OXIDIZABILITY OF IVT1 TITANIUM BETA-ALLOY AND ITS PROTECTION FROM GAS CORROSION,
N, M. Fedorchuk, D. V. Ignatov, and L. A. Petrova. 9 Oct 73, 11p Rept no. FTD-HT-23-143-74
Edited trans. of mono. Novyi Konstruktsionny Material-Titan, n.p. 1972 p131-134, by Paul J. Reiff.

Descriptors: (*Titanium alloys, *Oxidation), Aluminum alloys, Chromium alloys, Iron alloys, Molybdenum alloys, Aluminum compounds, Titanium compounds, Oxides.
Identifiers: Translations, Aluminum oxide, Titanium oxide.

The article discusses kinetics of oxidizing the beta-alloy of ITV1 titanium, containing 7% Mo, 5.5% Cr, 3% Fe, and 3% Al. The ITV1 alloy belongs to the metastable beta-alloys of titanium, which combine high technological plasticity in the quenched state with high strength and satisfactory plasticity after aging. Low-temperature beta to (alpha + beta) transformation occurring in the alloy does not effect the oxidation kinetics of IVT1 alloy. The change in the rate constants of the parabolic oxidation law at 740C can be explained by the (alpha + beta) to beta phase transformation. Surface alloying with aluminum effectively decreases the oxidation rate of the alloy at high temperatures; for example, at 1000C the oxidation rate of the samples coated with aluminum is cut by a factor of 12.

AD-768 432/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
OXIDIZABILITY OF AN-TYPE BETA-ALLOYS OF TITANIUM AND PROTECTING THEM AGAINST GAS CORROSION,
N. M. Fedorchuk, D. V. Igatov, and V. B. Gromova. 9 Oct 73, 9p Rept no. FTD-HT-23-144-74
Edited trans. of mono. Novyi Konstruktsionny Materials--Titan, n.p. 1972 p135-138, by Paul J. Reiff.

Descriptors: (*Titanium alloys, *Oxidation), Corrosion, Niobium alloys, Molybdenum alloys, Chromium alloys, High-temperature research, Aluminum, Coatings, USSR.
Identifiers: Translations.

The oxidation kinetics and phase composition of the scale of AN5, AN6, and AN6a titanium-niobium based test alloys is studied. Alloy AN5 is a composite of elements belonging to the Ti - Nb - Cr - Mo system. In the original state it has a beta-solid solution structure, which breaks down at 850C with the formation of the compound (TiNb)Cr2. The AN6 and AN6a alloys are distinguished from AN5 by aluminum and boron additions and the fact that they do not contain molybdenum.

AD-768 433/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
INVESTIGATION OF THE STRUCTURE AND CORRISION BEHAVIOR OF ALLOYS IN THE TI-TA-CR SYSTEM,
N. D. Tomashov, and G. P. Chernova. 10 Oct 73, 11p Rept no. FTD-HT-23-150-74
Edited trans. of mono. Novyi Konstruktsionny Material--Titan, n.p. 1972 p158-162, by Paul J. Reiff.

Descriptors: (*Titanium alloys, *Corrosion), Tantalum alloys, Chromium alloys, Heat treatment, USSR.
Identifiers: Translations.

Polythermal corss sections of the Ti-Ta-Cr system with a ratio of Ta:Cr = 1:3; 1:1; 3:1 were constructed. As the tantalum content in the alloys increases the stability of the beta-phase increases and the eutectic transformation is shifted to the region of higher overall tantalum and chromium content and lowest temperatures. As the tantalum content increases the corrosion rate for both quenched and annealed alloys decreases. The ternary Ti-Ta-Cr alloys with a ratio Ta:Cr = 3:1 and binary Ti-Ta alloys with 20% or more Ta become corrosion resistant in a 5% HCl solution at 100C. Alloying titanium with chromium reduces its corrosion properties in HCl solution. The corrosion rate increases as the chromium content increases for both quenched and annealed alloys.

AD-768 434/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CORROSION RESISTANCE OF TITANIUM ALLOYS IN MEDIA OF ORGANOCHLORINE SYNTHESIS,
A. M. Sukhotin, A. A. Pozdeeva, G. G. Mikhailova, and N. G. Boriskina. 9 Oct 73, 11p Rept no. FTD-HT-23-156-74
Edited trans. of mono. Novyi Konstruktsionny Material--Titan, n.p. 1972 p186-191, by Victor Mesenzeff.

Descriptors: (*Titanium alloys, *Corrosion), Chlorine compounds, Organic compounds, Molybdenum alloys, Tantalum alloys, USSR.
Identifiers: Chlorine organic compounds, Translations, Titanium alloy 32Mo, Titanium alloy 5Ta.

Titanium - Mo alloy 4201 has high corrosion resistance in media containing 10-17% hydrochloric and 10% formic acids at 100C. An increase in the corrosion resistance of titanium VT1-1 in organochlorine media in the pressence of hydrochloric acid at 100C can be achieved by introducing an oxidizer, for example, 0.01-0.1% oxygen compounds of chlorine. Titanium VT1-1 and alloys 4204 and 4201 break down very rapidly in anhydrous organochlorine media in the presence of phosgene and hydrogen chloride at a temperature of about 140C.

AD-768 438/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
INVESTIGATION OF DURALUMIN DURABILITY DURING REPEATED AXIAL TENSION WITH IMPACT AND IMPACTLESS LOADS,
V. Ya Slobodyanyuk. 9 Oct 73, 8p Rept no. FTD-HT-23-186-74
Edited trans. of Samoletostroenie i Tekhnika Vozdushnogo Flota (USSR) n25 p94-97 1971, by Paul J. Reiff.

Descriptors: (*Aluminum alloys, *Impact tests), Fatigue(Mechanics), USSR.
Identifiers: Duralumin, Translations.

AD-768 465/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CRITICAL VIEW OF RESEARCH ON THE STRUCTURAL DIAGRAMS OF THE TITANIUM-OXYGEN SYSTEM ON CONNECTION WITH THE FORMATION OF SUBOXIDES,
I. I. Kornilov. 9 Oct 73, 16p Rept no. FTD-HT-23-121-74
Edited trans. of mono. Novyi Konstruktsionny Material--Titan, n.p. 1972 p24-30, By rene E. Courville.

Descriptors: (*Titanium, *Oxygen), (*Phase studies, Titanium), Reviews, Titanium compounds, Oxides, USSR.
Identifiers: Translations, Titanium oxides.

AD-768 466/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
TRANSFORMATION DURING HEAT TREATMENT OF ALLOYS OF THE TI-MO SYSTEM WITH ALUMINUM, ZIRCONIUM AND TIN ADDITIVES,
L. P. Luzhnikov, V. M. Novikova, and I. S. Orlova. 28 Sep 73, 16p Rept no. FTD-HT-23-124-74
Edited trans. of mono. Novyi Konstruktsionny Material-Titan, n.p. 1972 p41-48, by Kathleen L. Dion.

Descriptors: (*Titanium alloys, Heat treatment), Phase studies, Plasticity, Molybdenum alloys, Aluminum alloys, Zirconium alloys, Tin alloys, Age hardening, USSR.
Identifiers: Translations.

The introduction of aluminum to an alloy with 5.5% Mo considerably increases its strength in the quenched state; zirconium has virtually no effect on hardness, but tin softens this alloy. The introduction of aluminum, zirconium or tin to the beta-alloys with 11 and 15% Mo increases strength in the quenched state, but the zirconium or the tin must be introduced in approximately twice the amount as aluminum in order to obtain the same degree of hardening. The introduction of Al, Zr, Sn to alloys with beta-structure (11 and 15% Mo) suppresses the formation of the omega-phase, and the region of its formation is narrowed and shifts to lower aging temperatures. The data show the advisability of using neutral hardeners of tin and zirconium in place of or in addition to aluminum during alloying. Zirconium in beta-alloys is especially useful. The alloys with zirconium possess higher plasticity after heat treatment than alloys with aluminum or tin.

AD-768 467/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PROPERTIES OF TABLE TITANIUM-NIOBIUM BASED BETA-ALLOYS,
V. G. Gromova, and A. M. Grishanova. 11 Oct 74, 9p Rept no. FTD-Ht-23-140-74
Edited trans. of Mono. Novyi Konstruktsionny Material-Titan n.p. 1972 p118-102, by Paul J. Reiff.

Descriptors: (*Titanium alloys, Mechanical properties), Niobium alloys, Oxidation, Phase studies, Intermetallic compounds, Plasticity, High-temperature research, USSR.
Identifiers: Translations.

The article presents the results of studies conducted on the mechanical properties, structure, and heat resistance of alloys of the Ti-Nb system, as well as certain properties of alloys with a titanium-niobium base. The data presented are of practical interest since a titanium-niobium base can insure treatment of alloys having a stable beta-structure.

AD-768 468/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
OXIDATION OF OT4 AND OT4-1 ALLOYS DURING PROLONGED HEATING IN AIR AT TEMPERATURES OF 200-400C,
E. N. Novikova, L. I. Luzhnikov, and V. F. Kononova. 10 Oct 73, 13p Rept no. FTD-HT-23-145-74
Edited trans. of mono. Novyi Konstruktsionny Material-Titan, n.p. 1972 p134-142, by Paul J. Reiff.

Descriptors: (*Titanium alloys, *Oxidation), High-temperature research, Hardness, Titanium compounds, Oxides, USSR.
Identifiers: Titanium oxides, Translations.

It was shown that during the process of prolonged heating in air at 200-400C the surface of OT4-1 and OT4 alloys is saturated with oxygen with the formation of a thin TiO2 oxide film on the surface and

on the alfin layer (solid solution of oxygen in an alpha-titanium) under it to thickness of up to 22 micrometers. During prolonged holding (more than 2,000 h) a large portion of the oxygen is released into the diffuser in the solid solution. Diffusion of oxygen in the solid solution leads to an increased alloy microhardness.

AD-768 469/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CONCERNING SEVERAL SYSTEMATIC ERRORS DURING THE DETERMINATON OF PARAMETERS OF THE DIFFUSION OF OXYGEN IN ALPHA-TITANIUM,
L. F. Sokiryanskii, D. V. Ignatov, A. Ya. Shinaev, L. V. Gubanova, and S. N. Smirnova. 28 Sep 73, 11p Rept no. FTD-HT-23-146-74
Edited trans. of mono. Novyi Konstuktsionny Material--Titan N.P. 1972 p142-145, by James R. Moore.

Descriptors: (*Titanium, *Oxygen), (*Oxygen, Diffusion), Heat of activation, USSR.
Identifiers: Translations.

AD-768 470/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ION NITRIDING OF TITANIUM IN A GLOW DISCHARGE,
Yu. K. Egorova, and N. I. Syskov. 28 Sep 73, 13p Rept no. FTD-HT-23-147-74
Edited trans. of mono. Novyi Konstruktsionny Material--Titan, n.p. 1972 p146-150, by Paul J. Reiff.

Descriptors: (*Titanium, *Coatings), (*Nitrides, Coatings), Glow discharges, Wear resistance, Titanium compounds, USSR.
Identifiers: Titanium nitrides, Translations.

The possibility of nitriding titanium in a glow discharge in a purified nitrogen medium was established. Nitriding in a glow discharge occurs two to three times faster than during furnance heating. The phase composition of the nitrided layer was defined as a function of processing mode. The depth of the nitride zone during processing in a glow discharge was no more than 3-4 micrometers Changing the nitriding regime affects the phase composition of the nitrided layer.

AD-768 471/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
INVESTIGATION OF TITANIUM ALLOYS AT HIGH TEMPERATURES IN A VACUUM,
V. K. Afonin, N. M. Pultsin, and S. A. Gorbunov. 9 Oct 73, 15p Rept no. FTD-HT-23-148-74
Edited trans. of mono. Novyi Konstruktsionny Material--Titan, 1972 p151-157, by Paul J. Reiff.

Descriptors: (*Titanium alloys, *High-temperature research), (*Oxidation, Titanium alloys), Vacuum, Aluminum alloys, Chromium alloys, Molybdenum alloys, Tin alloys, Manganese alloys, Sublimation, Titanium compounds, Oxides, Microstructure, Vanadium alloys, Films, USSR.
Identifiers: Translations.

Redistribution of alloying elements occurs in a vacuum of 10 to the minus seventh power mm Hg at temperatures of 800-1000C as result of the sublimation of the low-volatile compounds and elements on the surface of titanium alloys. This leads to a change in the physicochemical and mechanical properties of the titanium alloys. The qualitative agreement of thermodynamic and microspectral analysis results for redistribution of alloying elements was established. As a result of metallographic investigations of titanium alloys, the fact that sublimation is accompanied by formation of a step relief and emergence of dislocations on the sample surface was established.

AD-768 472/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
INVESTIGATION OF THE CORROSION RESISTANCE OF ALLOYS OF THE TI-TA-NB SYSTEM,
N. D. Tomashov, T. V. Chukalovskaya, G. P. Chernova, P. B. Budberg, and A. L. Gavze. 28 Sep 73, 11p Rept no. FTD-HT-23-149-74
Edited trans. of mono. Novyi Konstruktsionny Material-Titan, n.p. 1972 p162-166, by Paul J. Reiff.

Descriptors: (*Titanium alloys, *Corrosion), Tantalum alloys, Niobium alloys, Phase studies, USSR.
Identifiers: Translations.

The corrosion behavior of the alloys of the Ti-Ta-Nb system in 5% HCl at 100 degrees was investigated. It showed that as the Ta and Nb content in the alloy increases to 15-20% the corrosion rate drops slightly (by 1.5 to 2 times) and only upon adding alloying elements does the corrosion rate drop sharply. Under these conditions Ta increases the corrosion resistance of the alloys more effectively than Nb.

AD-768 473/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
MECHANISM OF TITANIUM CORROSION IN MINERAL ACIDS AND THEIR MIXTURES,
A. P. Brynza, L. I. Gerasyutina, and E. A. Zhivotovskii. 10 Oct 73, 13p Rept no. FTD-HT-23-153-74
Edited trans. of mono. Novyi Konstruktsionny Material-Titan, n.p. 1972 p174-179, by Paul J. Reiff.

Descriptors: (*Titanium, *Corrosion), Acids, Sulfuric acid, Hydrochloric acid, Phosphoric acids, Sodium chloride, Sulfates, Phosphates, Sodium compounds, Cleaning, USSR.
Identifiers: Translations, Sodium phosphates, Descaling.

The corrosion resistance and electromechanical behavior of titanium in solutions of sulphuric, hydrochloric, and phosphoric acid in the 20-80C temperature interval were studied. It was shown that given identical solution acidity, the most aggressive with respect to titanium is sulphuric acid. The addition of sodium chloride and sulphate to phosphoric acid stimulates titanium dissolution. Sodium phosphates slow down titanium corrosion in sulphuric and hydrochloric acid slightly. The most effective in this respect is tertiary sodium phosphate. A foundation was developed for selecting a solution for the chemical removal of scale which forms on titanium at 780-820C.

AD-768 497/0GA Reprint
Watervliet Arsenal N Y
NEW TECHNIQUES IN MEASURING PLASTIC STRAIN IN A MEMORY MATERIAL.
Technical rept.,
R. Vincent Milligan. Oct 73, 10p Rept no. R-WV-T-6-42-73
Presented at the International ISA Aerospace Instrumentation Symposium (19th), Las Vegas, Nevada, 21-23 May 73.
Availability: Pub. in Instrument Society of America, ASI 73239 p187-192 1973.

Descriptors: (*Nickel alloys, Strain(Mechanics)), (*Titanium alloys, Strain(Mechanics)), Test equipment, Stresses, Nickel compounds, Titanium compounds, Intermetallic compounds.
Identifiers: Materials with memory, Nitonol(Alloys).

A Nickel-Titanium memory material was studied for the purpose of characterizing its stress-strain behavior, energy absorption capacity, and cyclic response. Instrumentation problems encountered in the testing of this unique material are discussed from the standpoint of thermal recovery effects on strain readings from strain gages and LVDT-type extensometers. Nickel foil type temperature sensors were used to measure surface temperatures from heat generated in the course of plastically straining the material. In addition, the sensors also monitored the heat applied to the specimen to effect thermal recovery from the plastic strain. Temperature-time curves using a strip chart recorder exhibited possible phase changes occurring in the material during thermal recovery after the half cycle of straining. (Author)

AD-768 520/9GA Reprint
Battelle Columbus Labs Ohio
PHYSICS OF TITANIUM ALLOYS. II. FERMI DENSITY-OF-STATES PROPERTIES, AND PHASE STABILITY OF TI-AL AND TI-MO,
E. W. Collings, J. C. Ho, and R. I. Jaffee. 1973, 13p AFOSR-TR-73-1754
Contract F33615-69-C-1594, Grant AF-AFOSR-2084-71
See also AD-767 508.
Availability: Pub. in Titanium Science and Technology, v2 p831-842 1973.

Descriptors: (*Titanium alloys, Phase studies), Aluminum alloys, Molybdenum alloys, Magnetic properties, Specific heat, Elasticity, Band theory of solids.
Identifiers: Density of states, Magnetic susceptability, Body centered cubic lattices.

The results of magnetic and calorimetric measurements leading to evaluations of the Fermi densities-of-states, n(E(F)) and Debye temperatures, theta(D), of Ti-Al and Ti-Mo alloys in various structural states are presented. Phase stability in these systems is correlated with the observed variations of n(E(F)) and theta(D) with electron-to-atom ratio, z. The paper concludes with some general comments on the relationships between physical properties and phase stability in transition-metal binary alloys, and Ti-base alloys in particular. (Author)

AD-768 576/1GA Reprint
Martin Marietta Aerospace Denver Colo Denver Div
RELAXATION AND CYCLIC HARDENING OF THE SURFACE LAYER OF COPPER,
I. R. Kramer, and A. Kumar. 4 Jan 71, 8p AFOSR-TR-73-1940
Contract F44620-69-C-0065
Availability: Pub. in Metallurgical Transactions, v3 p1223-1227 May 72.

Descriptors: (*Copper, Hardening), Surface properties, Stresses, Dislocations.

The concept that cyclic hardening is primarily surface layer dependent is examined and the data supplemented by measurements of the activation volume. Activation volume measurements were carried out on annealed OFHC copper before and after cyclic hardening. As a result of cyclic hardening, the activation volume decreased markedly. The data shown that after cyclic hardening and removal of the surface layer the activation volume is the same as that of the annealed specimens deformed unidirectionally to the same strain. This shows that the density of dislocation obstacles of cyclically work hardened specimens increases only in the surface layer. The rate of relaxation of the surface layer stress was measured at 297, 340, and 395K. There appear to be two distinct regions in the relaxation rate curve. Initially, the rate of relaxation is very rapid and after about 10 min it decreases by a factor of 20, approximately. The apparent activation energy of the two portions of the relaxation rate curve is the same; 3340 cal per mol. (Author)

AD-768 627/2GA PC$4.25/MF$1.45
Mcdonnell Aircraft Co St Louis Mo

EVALUATION OF THE RELIABILITY AND SENSITIVITY OF NDT METHODS FOR TITANIUM ALLOYS.
Annual rept. 1 May 72-28 Feb 73,
Robert J. Lord. Mar 73, 110p* AFML-TR-73-107
Contract F33615-72-C-1203

Descriptors: (*Titanium alloys, *Non-destructive testing), Defects(Materials), Penetration, Dyes, Fluorescence, Radiography, Ultrasonic radiation, Castings, Effectiveness, Airframes.
Identifiers: *Fluorescent penetration tests, Non-destructive tests, Titanium alloy 6Al 4V, Ultrasonic tests.

The report describes the work conducted on a program designed to improve nondestructive testing techniques and, then, to evaluate the capability and reproducibility of the improved nondestructive testing techniques for the evaluation of discontinuities occurring in titanium. Reported are penetrant dwell times, penetrant bleed-out times, developer types, emulsification times, and water washing parameters required to effectively penetrant inspect parts which may contain a variety of crack sizes and porosity. Both post-emulsifiable and water washable fluorescent penetrants were investigated. A full scale Ti-6Al-4V ingot was melted in a manner to intentionally produce stabilized alpha defects. Documented are the details of the ingot melting and conversion to billet, bar, and plate. Results of ultrasonic and radiographic inspections of the ingot and billets are reported. (Author)

AD-768 794/0GA PC$4.25/MF$1.45
California Univ Los Angeles School of Engineering and Applied Science
NEW METHODS OF SYNTHESIS OF MATERIALS. (I). THE PROPERTIES OF RARE EARTH METALS AND ALLOYS. (II).
Semi-annual technical rept. no. 6,
R. F. Bunshah, and D. L. Douglas. Sep 73, 102p* Rept no. UCLA-ENG-7374
Grant DAHC15-70-G-15, ARPA Order-1643
See also Semi-annual technical rept. no. 5, AD-758 389.

Descriptors: (*Nickel, Vapor plating), (*Ceramic materials, Deposition), (*Nickel alloys, Oxidation), Foils, Yttrium compounds, Oxides, Titanium compounds, Carbides, Silicon compounds, Nitrides, Vaporization, Intermetallic compounds, Aluminum alloys, Synthesis(Chemistry).
Identifiers: *High rate physical deposition.

The report describes: Preparation of Nickel foil by high rate physical vapor deposition techniques and evaluation of its properties; Experiments on high rate deposition of Y2O3, TiC, Si3N4 by direct evaporation and of Y2O3 and Si3N4 by reactive evaporation and activated reactive evaporation; and The oxidation behavior of Ni3Al and Ni3Al-0.5Y at 1200C.

AD-768 807/0GA PC$3.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STATUS AND PROSPECTS OF USING TITANIUM AND ITS ALLOY IN THE NATIONAL ECONOMY,
I. I. Kornilov. 9 Oct 73, 23p Rept no. FTD-HT-23-118-74
Edited trans. of mono. Novyi Konstruktsionny Material Titan, n.p. 1972 p5-15, by Rene E. Courville.

Descriptors: (*Titanium, *Reviews), (*Titanium alloys, Reviews), USSR.
Identifiers: Translations.

AD-768 891/4GA PC$3.00/MF$1.45
Battelle Columbus Labs Ohio
EFFECT OF TEMPERATURE AND STRAIN UPON SHIP STEELS.
Final technical rept.,
R. L. Rothman, and R. E. Monroe. Mar 73, 42p* SSC-235
Contract N00014-71-C-5088

Descriptors: (*Steel, *Heat treatment), (*Ship plates, *Mechanical working), Cold working, Hot working, Temperature, Strain(Mechanics), Material forming.
Identifiers: Metal straightening, Steel A-441, Steel A-537A.

The effects of flame straightening and both hot and cold forming upon materials properties of hot-rolled, normalized, and quenched and tempered steels were investigated. Flame straightening was studied by first simulating the effects of time at temperature upon the tensile and impact properties of seven steels. Straightening was then performed within the determined limits upon four-foot-square plates which had been distorted by welding them into a rigid frame. As a result of these studies, it is recommended that flame straightening with appropriate controls be allowed as an acceptable process for distortion removal for both normalized and quenched and tempered steels. Simulations of outer fiber strain resulting from both hot and cold forming were conducted to determine the effects of temperature and strain upon properties. In general, it was found that either tensile or impact properties were reduced to some degree by most operations. (Author)

AD-768 926/8GA PC$5.75/MF$1.45
California Univ Los Angeles School of Engineering and Applied Science
THE CRITICAL CRACK-TIP OPENING DISPLACEMENT AND MICROSCOPIC AND MACROSCOPIC FRACTURE CRITERIA FOR METALS.
Technical rept.,
John N. Robinson, and Alan S. Tetelman. Aug 73, 232p* Rept nos. UCLA-ENG-7360, TR-11 AROD-8016:10-MC
Contract DAHC04-69-C-0008

Descriptors: (*Fracture(Mechanics), *Metals), Test equipment, Crack propagation, Strain(Mechanics), Steel, Aluminum alloys, Titanium alloys, Toughness, Silicones, Measurement, Stresses, Bending.
Identifiers: *Fracture strength.

The critical plane strain stress intensity factor (KIc), when combined with nondestructive testing, can be related to the fracture stress of a structure and has gained acceptance for the design of certain critical systems. Presently accepted methods of measuring KIc are, however, difficult and expensive to use for all but low toughness, high strength materials. The major objective of this investigation has been the development of a fracture criterion which can be related to the load-bearing capability of a structure yet is easily measurable using small inexpensive specimens, even for tough, low-strength materials. Because of its potential as a fracture criterion for fracture beyond general yield, particular emphasis has been placed on the measurement of on-load crack tip opening displacement, COD. Special significance has been placed on measuring critical values of plane strain COD at fracture initiation, (COD)Ic. (Modified author abstract)

AD-769 046/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE BEHAVIOR OF TITANIUM-BASE ALLOYS IN THE AGRESSIVE MEDIA OF SYNTHETIC RESIN PRODUCTION,
S. L. Lelchuk, and G. K. Grell. 16 Oct 73, 6p Rept no. FTD-HT-23-157-74
Edited trans. of mono. Novyi Konstruktsionny Material--Titan, n.p., 1972 p192-193, by Paul J. Reiff.

Descriptors: (*Titanium alloys, *Corrosion), Paints, Varnishes, Molybdenum alloys, Tantalum alloys, Organic compounds, Epoxy plastics, USSR, Steel.
Identifiers: Translations, Titanium alloy 32Mo, Titanium alloy 32 Mo 5Ta.

An alloy of titanium with 32% Mo was tested for corrosion resistance under production conditions for synthesizing bisphenol A. The resultant data show that it is corrosion resistant and can be used as a structural material for the reactor in the production of bisphenol A. Titanium alloy with 32% Mo and titanium with 5% Ta were tested under experimental conditions for synthesizinG VBFS-4 resin. Both alloys were corrosion resistant and can also be used as structural materials in the production of VBFS-4 resin.

AD-769 047/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE INVESTIGATION OF THE PARAMETERS OF GAS JETS FOR THE ATOMIZATION OF MELTS,
I. P. Goldaev, A. P. Motornenko, A. P. Shevchenko, and Yu. A. Lastivnyak. 11 Oct 73, 14p Rept no. FTD-HT-23-173-74
Edited trans. of Samoletostroenie i Tekhnika Vozdushnogo Flota (USSR) n25 p15-21 1971, by Frank C. Vaughn.

Descriptors: (*Metals, *Sublimation), Jets, Thermodynamics, Combustion chambers, Combustion products, Pressure, Gasoline, USSR.
Identifiers: Translations.

The use of supersonic high temperature gas jets for the atomization of liquid metals and melts is promising since it permits one to change the parameters of the working medium in a wide range and thereby obtain powders with prescribed properties. In order to investigate the basic factors which affect the gas jet parameters with the aid thermodynamic calculations the basic theoretical relationships of the gas temperatures in the combustion chamber, the density at nozzle section and the dynamic viscosity are established as functions of the pressure in the combustion chamber and the excess air ratio.

AD-769 048/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EXPERIMENTAL SETUP FOR TESTING HEAT-RESISTANT MATERIALS FOR THERMAL FATIGUE,
L. P. Lozitskii, A. A. Ivanenko, V. P. Berezlev, and V. A. Pulyaevskii. 16 Oct 73, 12p Rept no. FTD-HT-23-184-74
Edited trans. of Samoletostroenie i Tekhnika Vozdushnogo Flota (USSR) n25 p84-89 1971, by James R. Moore.

Descriptors: (*Fatigue(Mechanics), *Heat-resistant metals + alloys), (*Test equipment, Fatigue(Mechanics)), USSR.
Identifiers: Thermal fatigue, Translations.

The experimental setup described permits research to be carried out on the influence of a number of factors on thermal fatigue of materials and, in particular, the influence of structure, thermophysical properties of materials, various coatings and other factors. In addition, deformation of the samples, structural changes and other phenomena developed in the material by thermal cycling may be studied.

AD-769 074/6GA PC$3.00/MF$1.45
Kaiser Aluminum and Chemical Corp Pleasanton Calif Center for Technology
VACUUM TREATMENT OF PREALLOYED ALUMINUM POWDERS AT MODERATE TEMPERATURES.
Final rept. 1 Jan-31 Jul 73,
S. G. Roberts. Oct 73, 44p* AMMRC-CTR-73-33
Contract DAAG46-73-C-0040

Descriptors: (*Aluminum alloys, *Powder metallurgy), Powder alloys, Vacuum apparatus, Extrusion, Degasification, Mechanical properties, Heat treatment.
Identifiers: *Vacuum heating, Aluminum alloy 1Co 1-1/4Cu 2-1/2Mg 9Zn.

The objective was to determine if treating coarse, highly alloyed aluminum powder (Al-Zn-Mg-Cu plus Co or Zr) at moderate temperatures under relatively high vacuum would yield ductile wrought alloys at strength levels of 100 ksi. Canned, green compacts of -100+325 mesh power were heated at 600F and 700F; evacuated; sealed; hot compacted; decanned and extruded at a 8.5:1 ratio into 1.5-in. diameter rod. Longitudinally the extrusions were strong and ductile. The transverse ductility was poor due to insufficient deformation during extrusion and porosity not eliminated by the vacuum treatment. It is expected that further study of the process variables would yield the techniques required to obtain high transverse strength and ductility. (Modified author abstract)

AEC-tr-7450/GA PC$3.50/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
EXPERIMENTAL RESULTS OF SOME FRETTING CORROSION TESTS OF METALLIC MATERIALS.
P. Lupoli. 27p
Translation of RT/ING--(72)7.

Descriptors: (*Copper, *Fretting corrosion), (*Steels, Fretting corrosion), (*Zircaloy-2, Fretting corrosion), (*Inconel alloys, Fretting corrosion), Air, Corrosive effects, Nitrogen, Passivation, Water.

For abstract, see NSA 28 08, number 18706.

AECL-4431/GA PC$4.75/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
ELECTROCHEMICAL PROPERTIES AND OXIDATION OF SOME ZIRCONIUM ALLOYS IN MOLTEN SALT AT 300 EXP 0 C TO 500 EXP 0 C.
W. Hubner, and B. Cox. May 73, 53p
U.S. Sales Only.

Descriptors: (*Zirconium alloys, *Electrochemistry), (*Molten salts, *Corrosive effects), (*Zircaloy, Electrochemistry), Activation energy, High temperature, Hysteresis, Oxidation, Temperature dependence.

For abstract, see NSA 28 08, number 18744.

AECL-4448/GA PC$3.75/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
ACCELERATED OXIDATION OF ZIRCALOY-2 IN SUPERCRITICAL STEAM.
B. Cox. Apr 73, 32p
U.S. Sales Only.

Descriptors: (*Zircaloy-2, *Oxidation), Heat treatments, High pressure, Pressure dependence, Steam.

For abstract, see NSA 28 08, number 18745.

BDX-613-966(Rev.)/GA PC$3.00/MF$1.45
Bendix Corp., Kansas City, Mo.
CHEMICAL VAPOR DEPOSITION OF ALUMINUM. FINAL REPORT.
F. A. Clay. Aug 73, 14p
Contract AT(29-1)-613

Descriptors: (*Aluminium, *Deposition), Aluminium, Aluminium compounds, Aluminium oxides, Copper, Filaments, Graphite, Imides, Organometallic compounds, Stainless steels, Steels, Substrates, Sulfones.

For abstract, see NSA 28 08, number 20600.

CEA-CONF-2187/GA PC$4.50/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
HIGH TEMPERATURE RUPTURE.
G. Sainfort. 17 Jan 73, 48p CONF-721221-2
In French. U.S. Sales Only.

Descriptors: (*Ruptures, *Reviews), (*Molybdenum, Ruptures), (*Stainless steels, Ruptures), (*Nickel alloys, Ruptures), Cracks, Creep, Fracture properties, High temperature, Precipitation, Radiation effects, Slip, Strains, Temperature dependence, Very high temperature.

For abstract, see NSA 28 07, number 16002.

CEA-R-4415/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Bruyeres-le-Chatel (France). Centre d'Etudes.
APPLICATION OF IONOMETRY TO THE DETERMINATION OF FLUORINE IN URANIUM.
B. Hircq. Jul 73, 39p
In French. U.S. Sales Only.

Descriptors: (*Fluorine, *Chemical analysis), (*Uranium, Chemical analysis), Ions, Quantitative chemical analysis, Titration.

For abstract, see NSA 28 07, number 15203.

CONF-730813-4/GA PC$3.25/MF$1.45
Oak Ridge National Lab., Tenn.
TENSILE PROPERTIES OF FAST-REACTOR NEUTRON-IRRADIATED BCC METALS AND ALLOYS.
F. W. Wiffen. 1973, 22p

Descriptors: (*Molybdenum, *Physical radiation effects), (*Tantalum, Physical radiation effects), (*Molybdenum base alloys, Physical radiation effects), Dislocations, Ductility, Elongation, Fast neutrons, Fractures, High temperature, Medium temperature, Microstructure, Temperature dependence, Tensile properties, Titanium alloys, Tantalum alloy-t111, Chromium alloys, Vanadium base alloys.

For abstract, see NSA 28 08, number 18873.

CONF-730822-1/GA PC$3.50/MF$1.45
Oak Ridge National Lab., Tenn.
SUPPRESSION OF VOID FORMATION IN ZIRCONIUM.
M. H. Yoo. 1973, 29p

Descriptors: (*Zirconium, *Physical radiation effects), (*Metals, Physical radiation effects), (*Hexagonal lattices, Physical radiation effects), Anisotropy, Kinetics, Nucleation, Thermal expansion, Thermal stresses, Voids.

For abstract, see NSA 28 08, number 18874.

CONF-730916-1/GA PC$3.50/MF$1.45
Westinghouse Electric Corp., Madison, PA. Advanced Reactors Div.
LOW-CYCLE FATIGUE RESULTS FOR SPOT-WELDED AISI 316 STAINLESS STEEL STRIP AT ELEVATED TEMPERATURES.
P. N. Flagella, and R. Hundal. 1972, 30p
Contract AT(11-1)-3045

Descriptors: (*Stainless steel-316, *Spot welds), Fatigue, High temperature, Mechanical properties, Medium temperature, Thermal fatigue, Thermodynamic cycles.

For abstract, see NSA 28 08, number 18748.

COO-3429-9/GA PC$3.00/MF$1.45
Pittsburgh Univ., PA. Dept. Of Chemistry.
ELECTRONIC SPECIFIC HEATS OF ORDERED AND DISORDERED FEPD SUB 3 .
C. A. Bechman, W. E. Wallace, and R. S. Craig. 1973, 10p
Contract AT(11-1)-3429

Descriptors: (*Iron alloys, *Electronic specific heat), (*Palladium alloys, Electronic specific heat), Debye temperature, Fermi level, Hydrogen, Order parameters, Solubility.

For abstract, see NSA 28 07, number 17758.

COO-841-28/GA PC$4.50/MF$1.45
Minnesota Univ., Minneapolis. Inst. Of Tech.
DIFFUSION STUDIES IN LIQUID METALS.
M. Hsieh, and R. A. Swalin. Apr 73, 50p

Descriptors: (*Potassium, *Self-diffusion), (*Rubidium, Self-diffusion), High pressure, High temperature, Liquid metals, Medium temperature, Pressure dependence, Temperature dependence, Very high pressure.

For abstract, see NSA 28 07, number 17743.

DP-MS-72-6/GA PC$3.75/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S. C. Savannah River Lab.
IRRADIATION SWELLING AND GROWTH IN URANIUM AND OTHER ANISOTROPIC METALS.
W. R. McDonell. 6 Jun 72, 31p CONF-720607-35
Contract AT(07-2)-1

Descriptors: (*Uranium-alpha, *Physical radiation effects), (*Uranium, Physical radiation effects), (*Hexagonal lattices, Physical radiation effects), (*Metals, Physical radiation effects), Anisotropy, Cavities, Functional models, Magnesium, Neutrons, Rhenium, Swelling, Voids.

For abstract, see NSA 28 08, number 18875.

DP-MS-73-11/GA PC$3.50/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S. C. Savannah River Lab.
VOID MODEL FOR CAVITATIONAL SWELLING OF URANIUM AND OTHER ANISOTROPIC METALS.
W. R. McDonell. 27p CONF-730912-1
Contract AT(07-2)-1

Descriptors: (*Uranium, *Physical radiation effects), (*Metals, Physical radiation effects), (*Hexagonal lattices, Physical radiation effects), (*Uranium alloys, Physical radiation effects), Anisotropy, Cavities, Crystal defects, Functional models, Swelling, Voids.

For abstract, see NSA 28 08, number 18876.

EURFNR-1081/GA PC$6.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Material und Festkoerperforschung.
STUDIES ON THE REACTIVITY OF VANADIUM ALLOYS WITH SIMULATED FISSION PRODUCTS IN THE PRESENCE OF UO SUB 2 AND UC.
P. Hofmann, and O. Goetzmann. Jan 73, 80p
KFK-1718

Descriptors: (*Vanadium base alloys, *Compatibility), (*Titanium alloys, Compatibility), (*Silicon alloys, Compatibility), (*Zirconium alloys, Compatibility), Annealing, Burnup, Carburization, Cesium, Chemical reactions, Chromium, Corrosion, Corrosion resistance, Corrosive effects, Electron microscopy, Embrittlement, Fission products, Fuel cans, Hardening, High temperature, Iodine, Metallography, Mixtures, Oxygen additions, Reaction kinetics, Selenium, Tellurium, Uranium carbides, Uranium dioxide, Very high temperature, Chromium alloys.

For abstract, see NSA 28 07, number 15946.

HW-84442/GA PC$3.00/MF$1.45
General Electric CO., Richland, Wash. Hanford Atomic Products Operation.
CREEP RESISTANCE OF PLATINUM AND PLATINUM ALLOYS AT 1200 C.
J. W. Carter. 14 Oct 64, 15p

Descriptors: (*Platinum, *Creep), (*Platinum alloys, Creep), (*Rhodium alloys, Creep), Elongation, Stresses, Tensile properties, Time dependence, Very high temperature.

For abstract, see NSA 28 07, number 17763.

IS-T-581/GA PC$7.50/MF$1.45
Ames Lab., Iowa.
RECOVERY OF LOW TEMPERATURE NEUTRON IRRADIATION EFFECTS IN VANADIUM.
J. F. McIlwain. May 73, 108p
Contract W-7405-eng-82

Descriptors: (*Vanadium, *Physical radiation effects), Annealing, Electric conductivity, Fast neutrons, Impurities, Internal friction, Interstitials, Low temperature, Oxygen, Temperature dependence, Trapping.

For abstract, see NSA 28 08, number 18878.

IS-T-591/GA PC$5.25/MF$1.45
Ames Lab., Iowa.
LOW TEMPERATURE HEAT CAPACITY OF YPB SUB 3 , LAPB SUB 3 , LA SUB 5 PB SUB 3 , AND LA SUB 5 PB SUB 3 C.
J. T. Demel. May 73, 63p
Contract W-7405-eng-82

Descriptors: (*Lead alloys, *Electronic specific heat), (*Yttrium alloys, Electronic specific heat), (*Lanthanum alloys, Electronic specific heat), (*Lanthanum carbides, Electronic specific heat), Debye temperature, Specific heat, Ultralow temperature, Very low temperature, Superconductivity, Lead carbides.

For abstract, see NSA 28 08, number 18751.

LA-5232/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
DETERMINATION OF PLATINUM, IRIDIUM, AND RHODIUM IN URANIUM ALLOYS BY ATOMIC-ABSORPTION SPECTROPHOTOMETRY.
R. D. Gardner, A. L. Henicksman, and W. H. Ashley. Jul 73, 4p
Contract W-7405-eng-36

Descriptors: (*Platinum, *Absorption spectroscopy), (*Iridium, Absorption spectroscopy), (*Rhodium, Absorption spectroscopy), (*Uranium base alloys, *Chemical analysis), Quantitative chemical analysis.

For abstract, see NSA 28 08, number 17875.

LBL-1181/GA PC$5.25/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
STRUCTURE, STRENGTH, AND TOUGHNESS OF FE/CR/C MARTENSITIC STEELS.
J. A. McMahon. Jan 73, 63p
Contract W-7405-eng-48

Descriptors: (*Steels, *Mechanical properties), (*Iron alloys, Mechanical properties), (*Chromium alloys, Mechanical properties), Carbides, Carbon additions, Compression strength, Fracture properties, High temperature, Martensite, Microstructure, Morphological changes, Phase transformations, Quantity ratio, Temperature dependence, Tensile properties.

For abstract, see NSA 28 07, number 17778.

LBL-1476/GA PC$4.25/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
EVALUATION OF THE END QUENCH TEST AS A DESIGN CRITERION.
R. N. Lott. Jun 73, 43p
Contract W-7405-eng-48

Descriptors: (*Steels, Quenching), (*Quenching, *Testing), Microstructure, Quench hardening.

For abstract, see NSA 28 08, number 20623.

LBL-1484/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
AN IRON--NICKEL--TITANIUM ALLOY WITH OUTSTANDING TOUGHNESS AT CRYOGENIC TEMPERATURE.
S. Jin, J. W. Jr. Morris, and V. F. Zackay. Mar 73, 20p CONF-730805-3
Contract W-7405-eng-48

Descriptors: (*Iron base alloys, *Mechanical properties), (*Nickel alloys, Mechanical properties), (*Titanium alloys, Mechanical properties), Fracture properties, Impact strength, Tensile properties, Ultralow temperature.

For abstract, see NSA 28 08, number 20624.

LBL-1491/GA PC$4.75/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
STRUCTURE AND PROPERTIES OF TRIP STEELS PROCESSED BY DEFORMATION AND THERMAL CYCLING.
H. E. Jr. Adkins. Apr 73, 52p
Contract W-7405-eng-48

Descriptors: (*Steels, *Mechanical properties), Austenite, Chromium, Deformation, Fine structure, Martensite, Plasticity, Stability, Thermal cycling, Yield strength.

For abstract, see NSA 28 08, number 20625.

N-72-30465/GA PC$4.00/MF$1.45
Montana Coll. Of Mineral Science and Technology, Butte (Usa).
METALLOGRAPHIC EVALUATION OF SOME COATED NIOBIUM ALLOYS.
V. Griffiths. Jan 72, 28p NASA-CR-127917

Descriptors: (*Niobium alloys, *Metallography), Coatings, Deposits, Electron microscopy, Reentry, Space vehicles, Stability, Surface coating, Thermodynamic properties.

For abstract, see NSA 28 08, number 18753.

N-73-17625/GA PC$5.45/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. Astronuclear Lab.
DEVELOPMENT OF ADVANCED HIGH-STRENGTH TANTALUM-BASE ALLOYS. PHASE 3: INFLUENCE OF METALLURGICAL CONDITION ON THE MECHANICAL PROPERTIES OF ASTAR-811C SHEET. FINAL REPORT, OCTOBER 1967--JULY 1970.
R. L. Ammon, R. W. Jr. Buckman, and D. L. Harrod. Dec 72, 88p NASA-CR-121096, WANL-M-FR-72-9
Contract NAS3-10939

Descriptors: (*Tantalum base alloys, *Creep), (*Tungsten alloys, Creep), (*Rhenium alloys, Creep), Annealing, Carbon additions, Cold working, Hafnium additions, Metallurgy, Quenching, Recrystallization, Welded joints.

For abstract, see NSA 28 08, number 18754.

N73-30507/0GA PC$7.00/MF$1.45
IIT Research Inst., Chicago, Ill. Metals Research Div.
ADDITIONAL THERMAL FATIGUE DATA ON NICKEL- AND COBALT-BASE SUPERALLOYS, PART 1.
Final Report.
M. A. H. Howes. 15 Mar 73, 100p NASA-CR-121211, IITRI-B6107-34-PT-1
Contract NAS3-14311

Descriptors: *Fatigue (Materials), *Fatigue tests, *Fluidized bed processors, *Heat resistant alloys, Materials tests, Mechanical properties, Thermophysical properties.

For abstract, see STAR 1121

N73-30509/6GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OBSERVATION OF OXIDE PARTICLES BELOW THE APPARENT OXYGEN SOLUBILITY LIMIT IN TANTALUM.
S. Stecura. Sep 73, 17p NASA-TM-X-2889, E-7530

Descriptors: *Oxygen, *Solubility, *Tantalum, Grain boundaries, Oxides, Polycrystals, X ray diffraction.

For abstract, see STAR 1121

N73-30510/4GA PC$19.50/MF$1.45
Grumman Aerospace Corp., Bethpage, N.Y. Research Dept.
SEGREGATION EFFECTS DURING SOLIDIFICATION IN WEIGHTLESS MELTS.
Final Report, 1 Jan. 1972 - 29 Jun. 1973.
C. Li. Jun 73, 350p NASA-CR-124358, RE-458
Contract NAS8-27891

Descriptors: *Metal working, *Reduction (Chemistry), *Smelting, *Weightlessness, Mechanical properties, Numerical analysis, Physical properties, Product development.

For abstract, see STAR 1121

N73-31030/2GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THERMOTRANSPORT IN LIQUID ALUMINUM-COPPER ALLOYS.
B. N. Bhat. Sep 73, 13p NASA-TR-R-415, M-702

Descriptors: *Aluminum alloys, *Copper alloys, *Heat transfer, *Liquid metals, *Trace elements, Composition (Property), Copper, Temperature gradients.

For abstract, see STAR 1122

N73-31493/2GA PC$14.25/MF$1.45
Metcut Research Associates, Inc., Cincinnati, Ohio. Thermophysical Properties Research Center.
CHARACTERIZATION OF THE MECHANICAL AND PHYSICAL PROPERTIES OF TD-NICR (NI-20CR-2THO2) ALLOY SHEET.
L. J. Fritz, W. P. Koster, and R. E. Taylor. 1973, 244p NASA-CR-121221
Contract NAS3-15558

Descriptors: *Chromium alloys, *Mechanical properties, *Nickel alloys, Electrical resistivity, Precipitation hardening, Thermal conductivity, Thermal diffusivity, Thorium.

For abstract, see STAR 1122

N73-31494/0GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TENSILE AND FATIGUE DATA FOR IRRADIATED AND UNIRRADIATED AISI 310 STAINLESS STEEL AND TITANIUM - 5 PERCENT ALUMINUM - 2.5 PERCENT TIN: APPLI-

CATION OF THE METHOD OF UNIVERSAL SLOPES.
C. E. Debogdan. Sep 73, 19p NASA-TM-X-2883, E-7532

Descriptors: *Aluminum alloys, *Slopes, *Stainless steels, *Titanium alloys, Fatigue life, Irradiation, Tensile strength, Tin alloys.

For abstract, see STAR 1122

N73-31496/5GA PC$8.25/MF$1.45
TRW, Inc., Cleveland, Ohio. Materials Technology Labs.
GENERATION OF LONG TIME CREEP DATA ON REFRACTORY ALLOYS AT ELEVATED TEMPERATURES.
Final Report.
K. D. Sheffler, and R. R. Ebert. Sep 73, 122p NASA-CR-134481, TRW-ER-7648
Contract NAS3-15554

Descriptors: *Creep properties, *Tantalum alloys, *Tungsten, High temperature, Lithium, Microstructure.

For abstract, see STAR 1122

N73-31498/1GA PC$10.00/MF$1.45
Westinghouse Astronuclear Lab., Pittsburgh, Pa.
MECHANICAL PROPERTY DETERMINATION OF HIGH CONDUCTIVITY METALS AND ALLOYS.
Final Report.
D. L. Harrod, E. Vandergrift, and L. France. Feb 73, 158p NASA-CR-133890, WANL-M-FR-72-005
Contract NAS7-725

Descriptors: *Beryllium alloys, *Copper alloys, *Mechanical properties, *Thermal conductors, Combustion chambers, Compressive strength, Elastic properties, Stress analysis, Temperature gradients, Tensile stress.

For abstract, see STAR 1122

N73-31511/1GA PC$7.25/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands).
FATIGUE CRACK PROPAGATION DATA FOR TITANIUM SHEET ALLOYS, TI-5AL-2.5SN.
Interim Report.
R. J. H. Wanhill, A. M. Otter, W. J. Vandervet, and F. A. Jacobs. Jul 72, 101p NLR-TR-72093-U, IR-3
Subm-Sponsored by the Neth. Agency for Aerospace Programmes (Nivr).

Descriptors: *Crack propagation, *Environmental tests, *Fatigue (Materials), *Titanium alloys, Air, Aluminum alloys, Argon, Mechanical properties, Tin alloys, Water.

For abstract, see STAR 1122

N73-31530/1GA PC$7.50/MF$1.45
Westinghouse Astronuclear Lab., Pittsburgh, Pa.
INVESTIGATION OF HIGH TEMPERATURE FRACTURE OF T-111 AND ASTAR-811C.
Final Report.
R. E. Gold. Apr 71, 100p NASA-CR-72859, WANL-PR(VVV)-003
Contract NAS3-11827

Descriptors: *Crystal defects, *Fracture mechanics, *High temperature tests, Creep tests, Electron microscopes, Gas tungsten arc welding, Recrystallization, Temperature profiles, Tensile tests, Wrought alloys.

For abstract, see STAR 1122

N73-31804/0GA PC$8.50/MF$1.45
Pratt and Whitney Aircraft, West Palm Beach, Fla. Research and Development Center.
PROPERTIES OF MATERIALS IN HIGH PRESSURE HYDROGEN AT CRYOGENIC, ROOM, AND ELEVATED TEMPERATURES.
Final Report, 29 Jun. 1970 - 31 Jul. 1973.
J. A. Harris, Jr., and M. C. Vanwanderham. 31 Jul 73, 129p NASA-CR-124394, FR-5768
Contract NAS8-26191

Descriptors: *Alloys, *Environmental tests, *Hydrogen, *Mechanical properties, *Temperature effects, Cobalt alloys, Fatigue life, Fracture mechanics, Iron alloys, Nickel alloys, Tensile tests, Titanium alloys.

For abstract, see STAR 1122

ORNL-TM-4189/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
EVALUATION OF HASTELLOY N ALLOYS AFTER NINE YEARS EXPOSURE TO BOTH A MOLTEN FLUORIDE SALT AND AIR AT TEMPERATURES FROM 700 TO 560 EXP 0 C.
J. W. Koger. Dec 72, 39p
Contract W-7405-eng-26

Descriptors: (*Inor-8, *Corrosion resistance), (*Hastelloy n, Corrosion resistance), (*Niobium alloys, Corrosion resistance), (*Lithium fluorides, *Corrosive effects), Beryllium fluorides, High temperature, Mass transfer, Molten salts, Thorium fluorides, Uranium tetrafluoride, Voids, Welded joints, Zirconium fluorides.

For abstract, see NSA 28 07, number 15949.

ORNL-4871/GA PC$5.45/MF$1.45
Oak Ridge National Lab., Tenn.
RADIATION STRENGTHENING AND EMBRITTLEMENT IN HEAVY-SECTION STEEL PLATES AND WELDS.
W. J. Stelzman, and R. G. Berggren. Jun 73, 57p
Contract W-7405-eng-26

Descriptors: (*Steel-astm-a533, *Physical radiation effects), (*Steel-astm-a302, Physical radiation effects), (*Welded joints, Physical radiation effects), Charpy test, Embrittlement, Fast neutrons, Impact strength, Neutron beams, Tensile properties, Thickness.

For abstract, see NSA 28 07, number 16088.

PATENT-3 522 037/GA Not available NTIS
Department of the Navy Washington D C
STAINLESS STEEL COMPOSITIONS WITH INCREASED CORROSIVE RESISTANCE.
Patent,
Norbert D. Greene, and Bryan E. Wilde. Filed 31 Oct 66, patented 28 Jul 70, 4p Rept nos. PAT-APPL-591 352,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Stainless steel, *Patents), Corrosion resistance, Nickel alloys, Chromium alloys.
Identifiers: Steel 304, PAT-CL-125.

The patent relates to a modified 304 stainless steel having the following alloying elements: 18 to 20% chromium, 8 to 12% nickel, up to .08% carbon, up to 1% silicon, up to 1% manganese, up to 0.1% sulfur, up to .45% phosphorous. The steel may also contain from .3 to .6% copper and/or .3 to .6% molybedenum.

PATENT-3 546 151/GA Not available NTIS
Department of the Navy Washington D C
WATER REPELLENT CORROSION INHIBITING COMPOSITION.
Patent,
Hayward R. Baker, and Robert N. Bolster. Filed 10 Jun 68, patented 8 Dec 70, 4p Rept nos. PAT-APPL-735 550,
Government-owned invention available for licensing. Copy of patent available Commisioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Moistureproofing, *Steel), (*Electric insulation, Moistureproofing), (*Corrosion inhibition, Electric insulation), (*Patents, Moistureproofing), Waxes, Vinyl plastics, Amides, Salts, Amines, Succinic acids.
Identifiers: PAT-CL-260-28-5, Addition compounds.

The invention describes liquid compositions which are solutions in a volatile aliphatic hydrocarbon solvent of from about 35 to 40% by weight of n-butanol and a small proportion each of mixed isomers of a long chain alkylamine salt of a C8 to C22 alkyl or alkenyl succinic acid long chain alkylmonoamide, paraffin wax, an ethylene-vinylacetate copolymer having a vinylacetate component of from about 25 to 33% by weight, and, optionally, an antioxidant. The liquid compositions are useful for displacing water from and providing a dry, water repellent, corrosion-inhibiting coating on electrical insulator mountings, particularly when they are in direct association with steel parts.

PATENT-3 763 493/GA Not available NTIS
Department of the Interior, Washington, D.C.
RECOVERY OF NICKEL AND COBALT.
Patent,
Larry J. Nicks, Kenneth P. V. Lei, and Thomas A. Smith. Filed 31 Aug 72, patented 9 Oct 73, 4p PAT-APPL-285 263, DOCKET/MIN-1905
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Nickel, *Materials recovery), (*Cobalt, Materials recovery), (*Patents, Materials recovery), Electrolytic cells, Potassium chloride, Lithium chloride, Calcium chloride, Sodium chloride.
Identifiers: PAT-CL-204-64-R.

The patent describes nickel and cobalt separation and recovery from ores or alloy scrap by selective cathodic reduction and deposition of nickel in a galvanic cell. The galvanic cell employs separate cathode and anode sections, a nickel cathode, a cobalt anode and a fused salt electrolyte. The catholyte and anolyte compartments of the cell are connected by means of a porous diaphragm, while the cathode and anode are directly electrically connected externally.

PB-224 653/6GA PC$2.75/MF$1.45
Bureau of Mines, Washington, D.C.
OXIDATION OF CEMENT COPPER BY FLASH ROASTING.
Rept. of investigations,
Walter W. Fisher, and Rees D. Groves. Sep 73, 15p* BuMines-RI-7794
Prepared by Salt Lake City Metallurgy Research Center, Utah.

Descriptors: (*Copper, *Roasting), Oxidation, Pyrometallurgy, Refining.
Identifiers: Flash roasting, Cement copper.

Cement copper was flash roasted in a vertical tube furnace to convert the copper to acid soluble oxides as part of a postulated process for refining cement copper by oxidation roasting, acid leaching, and electrowinning. The results of the study showed that the oxidation was a linear function of oxygen concentration between zero and 20 percent, but above 20 percent oxygen there was no further increase in oxidation. Therefore, air was the optimum oxidizing atmosphere in this flash roasting system. The oxidation followed a parabolic rate law as the roasting temperature was increased from 400 to 800C. Extrapolation of the data, based on the parabolic law, indicated that at 400, 500, 600, 700, and 800C, the respective roasting times required for complete conversion to soluble oxides were 75, 37, 21, 7.7, and 4.6 seconds. Cyclic-roasting test results could not be used to extend the roasting time and substantiate the data extrapolation. (Author)

SGAE-2126/GA PC$3.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf.
KINETIC ASPECTS OF THE CORROSION OF AUSTENITIC STAINLESS STEEL IN HIGH TEMPERATURE SODIUM.
N. Schwarz, and G. Rajakovics. Apr 73, 19p
CONF-730449-1
U.S. Sales Only.

Descriptors: (*Stainless steel-316, *Corrosion), (*Sodium, *Corrosive effects), Austenite, Fbr type reactors, Hot spots, Meetings, Sodium cooled reactors, Surface properties, Very high temperature, Weight.

For abstract, see NSA 28 07, number 15950.

UCID-16253/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
PROPOSED MODEL RELATING STRESS, STRAIN, STRAIN RATE, AND STRAIN ENERGY.
D. E. Lord. 24 Apr 73, 39p
Contract W-7405-Eng-48

Descriptors: (*Stresses, *Mathematical models), (*Strains, Mathematical models), (*Steels, Stresses), (*Titanium alloys, Stresses), Binding energy, Impact shock, Materials testing, Physical radiation effects, Tantalum, Tungsten.

For abstract, see NSA 28 07, number 16007.

UCID-16254/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
MODEL RELATING STRESS, STRAIN, STRAIN RATE, AND TEMPERATURE WITH AN EXPERIMENTAL DATA FIT FOR A URANIUM--7.5% NIOBIUM--2.5% ZIRCONIUM ALLOY.
D. E. Lord. 24 Apr 73, 18p
Contract W-7405-Eng-48

Descriptors: (*Uranium base alloys, *Mechanical properties), (*Niobium alloys, Mechanical properties), (*Zirconium alloys, Mechanical properties), Mathematical models, Strains, Stresses, Temperature dependence, Ternary alloy systems, Thermodynamic properties.

For abstract, see NSA 28 07, number 16008.

UCID-16286/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
MODEL RELATING STRESS, STRAIN, STRAIN RATE, AND TEMPERATURE WITH AN EXPERIMENTAL DATA FIT FOR HIGH-PURITY TANTALUM.
D. E. Lord. 18 Jun 73, 19p
Contract W-7405-eng-48

Descriptors: (*Tantalum, *Deformation), Functional models, Interstitials, Recrystallization, Strains, Stresses.

For abstract, see NSA 28 08, number 18757.

UCLA-34-P-177-12/GA PC$3.25/MF$1.45
California Univ., Los Angeles. Dept. Of Materials.
REACTOR STEELS STUDIES. QUARTERLY PROGRESS REPORT, JANUARY--MARCH 1972.
A. J. Ardell, K. Ono, and A. S. Tetelman. Jul 72, 25p
Contract AT(04-3)-34

Descriptors: (*Stainless steel-316, *Ruptures), Cold working, High temperature, Lifetime, Microstructure, Stresses, Temperature dependence, Very high temperature.

For abstract, see NSA 28 07, number 16009.

UCLA-34-P-177-13/GA PC$3.00/MF$1.45
California Univ., Los Angeles. Dept. Of Materials.
REACTOR STEELS STUDIES. QUARTERLY PROGRESS REPORT, APRIL--JUNE 1972.
K. Ono, A. S. Tetelman, and A. J. Ardell. Sep 72, 13p
Contract AT(04-3)-34

Descriptors: (*Chromium-molybdenum steels, *Tensile properties), (*Croloy, Tensile properties), (*Stainless steel-316, *Ruptures), (*Fftf reactor, *Fuel cans), Carbon, Chemical composition, High temperature, Quantity ratio, Temperature dependence, Tempering, Yield strength, Stresses, Time dependence, Very high temperature.

For abstract, see NSA 28 07, number 16010.

UCLA-34-P-177-14/GA PC$3.50/MF$1.45
California Univ., Los Angeles. Dept. Of Materials.
DIFFRACTION CONTRAST EFFECTS AT EXTRINSIC GRAIN BOUNDARY DISLOCATIONS.
R. C. McDonald, and A. J. Ardell. Feb 73, 26p
Contract AT(04-3)-34

Descriptors: (*Stainless steel-304, Grain boundaries), (*Stainless steel-316, Grain boundaries), (*Grain boundaries, *Dislocations), (*Electron microscopy, *Images), Deformation, Diffraction.

For abstract, see NSA 28 08, number 18758.

UCRL-Trans-10698/GA PC$3.00/MF$1.45
CREEP RESISTANCE AND CYCLIC HEATING STABILITY IN THE ALPHA -REGION OF BINARY ALLOYS OF URANIUM WITH TITANIUM, VANADIUM, AND CHROMIUM.
N. E. Sladkova, and V. K. Grigorovich. 1963, 9p
Translated from pp 162-168 of Stroenie i Svoistva Splavov Urana, Toriya i Tsirkoniya, Moscow, 1963.

Descriptors: (*Uranium base alloys, *Creep), (*Titanium alloys, *Thermodynamic properties), (*Vanadium alloys, Thermodynamic properties), (*Chromium alloys, Thermodynamic properties), Deformation, Elongation, Nuclear fuels, Recrystallization, Stability, Thermal cycling, Thermal expansion.

For abstract, see NSA 28 07, number 16011.

UCRL-74260(Rev.1)/GA PC$3.25/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
DEPENDENCE OF ACOUSTIC EMISSION OF STRAIN RATE IN 7075-T6 ALUMINUM.
M. A. Hamstad, and A. K. Mukherjee. 29 Jun 73, 22p CONF-730511-4

Descriptors: (*Aluminium, *Acoustic emission testing), Emission, Plasticity, Sound waves, Strains, Tensile properties.

For abstract, see NSA 28 08, number 20657.

11G. Miscellaneous Materials

LMSC/D-243287/GA PC$5.50/MF$1.45
Lockheed Missiles and Space CO., Palo Alto, Calif. Lockheed Palo Alto Research Lab.
DEVELOPMENT OF X-RAY CONVERSION PHOSPHORS. FIFTH ANNUAL REPORT, (TASK II).
R. A. Buchanan, L. E. Sobon, R. V. Alves, and T. G. Maple. Aug 71, 70p
Contract AT(04-3)-836

Descriptors: (*Image intensifiers, *Phosphors), Biomedical radiography, Gadolinium oxides, Gadolinium sulfides, Performance, X-ray radiography.

For abstract, see NSA 28 08, number 18387.

PATENT-3 491 027/GA Not available NTIS
Department of the Navy Washington D C
COMPOSITION AND METHOD FOR CLEANING SALT RESIDUES FROM METAL SURFACES.
Patent,
Hayward R. Baker, and Paul B. Leach. Filed 28 Feb 66, patented 20 Jan 70, 2p Rept nos. PAT-APPL-532 532,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Cleaning, *Metals), (*Aircraft engines, Cleaning), (*Patents, Cleaning), Ethylendinitrilo tetraacetates, Salts, Helicopter engines, Ethylenediamine, Sodium compounds, Polyethylene plastics, Propenes, Surface-active substances, Acetates, Corrosion, Nitrites.
Identifiers: PAT-CL-252-86, Sodium nitrites, Formulations.

The patent describes aqueous compositions which contain, by weight, 2.25 to 2.75% of tetrasodium ethylenediamine tetraacetate dihydrate, 9 to 11% of sodium nitrite, 9 to 11% of a water soluble nonionic surfactant, for example, a poloxyethylene-polyoxypropylene alcohol, 4.5 to 5.5% of sodium benzoate, 33 to 39% of water, 14 to 18% of isopropanol and 14 to 23% of methanol. The compositions when diluted with water provide washing solutions which are effective to quickly flush salt water spray residues from compressor surfaces in gas turbine engines of carrier based aircraft.

TID-26352/GA PC$5.50/MF$1.45
Lockheed Missiles and Space CO., Palo Alto, Calif. Lockheed Palo Alto Research Lab.
STUDY OF RARE EARTH ACTIVATED MATERIALS FOR RADIATION-SENSING APPLICATIONS. THIRD ANNUAL REPORT.
K. A. Wickersheim, R. A. Buchanan, L. E. Sobon, R. V. Alves, and J. J. Pearson. Jun 69, 68p
Contract AT(04-3)-674

Descriptors: (*Phosphors, *Image intensifiers), (*X-ray detection, Phosphors), Chemical preparation, Crystal growth.

For abstract, see NSA 28 08, number 18389.

11H. Oils, Lubricants, and Hydraulic Fluids

AD-768 901/1GA PC$3.75/MF$1.45
Southwest Research Inst San Antonio Tex Army Fuels and Lubricants Research Lab
DEVELOPMENT OF A DIESEL ENGINE TEST TECHNIQUE FOR EVALUATING ARCTIC ENGINE OILS.
Final rept. Feb 70-Jul 72,
Sidney J. Lestz. Sep 73, 81p* Rept no. AFLRL-24
Contract DAAD05-70-C-0250

Descriptors: (*Fuel oil, *Cold weather tests), (*Lubricants, Cold weather tests), Engines + motors, Wear resistance, Military requirements.

An engine test technique was developed for evaluating the performance of sub-zero engine oils in high-output diesel engines. Field tested lubricants were used to develop the laboratory engine performance criteria. Validity of the test procedure is demonstrated by direct laboratory to field correlation. The major areas of test technique development, establishment of performance criteria, lubricant evaluations, and overall lubricant performance are presented and discussed as an integrated effort rather than each as a separate project phase. Illustrations of hardware, including test set-up and test components are included for summary purposes only. Physical and compositional properties of the test development lubricant are discussed which help explain why the engine discriminates lubricant quality under high-output conditions. The test method developed as a result

of this work could be used to qualify military arctic engine oil candidates. (Author)

AD-768 924/3GA PC$3.00/MF$1.45
Midwest Research Inst Kansas City Mo
GRAPHITE FLUORIDE: A PROPOSED SOLID LUBRICANT.
Technical rept. 3 Jan-1 Dec 72,
Karl R. Mecklenburg, and B. D. McConnell. Apr 73, 49p* AFML-TR-73-121
Contract F33615-72-C-1374

Descriptors: (*Lubricants, Mechanical properties), (*Graphited materials, Mechanical properties), Tests, Fluorides, Wear resistance, Friction, Stresses.
Identifiers: *Solid lubricants, Performance evaluation, Friction tests, Wear tests, *Graphite fluoride.

Graphite fluoride, a proposed solid lubricant material, was evaluated with a sphere-on-plane tester to determine if previously generated data could be reproduced. Preliminary experiments with (CFx)n (graphite fluoride), substituted int existing film formulations in place of MoS2, revealed extremely short wear-lives when other test geometries were used. However, with the sphere-on-plane configuration, the data previously reported were reproduced. Wear-lives and friction coefficients for burnished MoS2 and (CFx)n are presented, along with friction coefficients for the bare metal combinations used. Also included are compressive stress values in the test zone based upon the starting and finishing contact areas. (Author)

PATENT-3 493 279/GA Not available NTIS
Department of the Navy Washington D C
BEARING LUBRICATION APPARATUS.
Patent,
Kenneth H. Warren. Filed 29 May 68, patented 3 Feb 70, 4p Rept nos. PAT-APPL-733 069,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Lubrication, *Patents), (*Antifriction bearings, Lubrication), Greases, Honeycomb cores, Flow fields, Oils.
Identifiers: PAT-CL-308-187.

The patent described apparatus for lubrication of anti-friction bearings which uses the oil bleeding characteristics of grease. The apparatus consists of a housing for attachment to a bearing and a grease reservoir wherein the grease is retained in a sloping honeycomb structure or similar foraminous material.

PATENT-3 752 847/GA Not available NTIS
Midwest Research Inst., Kansas City, Mo.
FLUORINATED ESTERS OF POLYCARBOXYLIC ACIDS.
Patent.
L. L. Breed, and R. L. Elliott. Patented 14 Aug 73, 2p NASA-CASE-MFS-21040-1,
Misc-Filed 23 Sep. 1971 Supersedes N72-10135 (10 - 01, p 0021). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Carboxylic acids, *Esters, *Fluorination, *Lubricants, *Temperature, Chemical properties, Greases, Patents, Thickeners (Materials), Wear.

Fluorine containing esters of polycarboxylic acids are discussed. The use of these esters as extreme temperature lubricants and base fluids for greases is investigated.

11I. Plastics

AD-768 711/4GA PC$3.00/MF$1.45
Explosives Research and Development Establishment Waltham Abbey (England)
AN ASSESSMENT OF RECENTLY DEVELOPED THERMOPLASTIC POLYURETHANE AND POLYESTER ELASTOMERS.
Technical rept.,
J. Wright. Apr 73, 26p Rept no. ERDE-TR-138
DRIC-BR-36668

Descriptors: (*Isocyanate plastics, Aging(Materials)), (*Polyester plastics, Aging(Materials)), Mechanical properties, Molding, Great Britain.
Identifiers: Injection molding.

The processing characteristics and aging properties of thermoplastic, injection moulded polyurethane and polyester copolymer elastomers have been assessed. The aging properties of the polyurethanes showed little improvement compared with cast and millable polyurethane elastomers, although their processibility was easier and they could be more economical for the production of large numbers of small components. The polyester copolymers have very good mechanical and aging properties and should be considered as serious candidates for replacing conventional elastomers in many high performance applications.

BDX-613-797/GA PC$3.75/MF$1.45
Bendix Corp., Kansas City, Mo.
MATERIAL AND PROCESS DEVELOPMENT OF POLYURETHANE FOAM, FY73-1. QUARTERLY REPORT.
J. R. Fender. Apr 73, 32p
Contract AT(29-1)-613

Descriptors: (*Composite materials, *Performance testing), (*Wood, Composite materials), (*Metals, Composite materials), (*Foams, *Fire resistance), Composite materials, Cyanurates, Flames, Polyurethanes, Production, Temperature control.

For abstract, see NSA 28 08, number 20599.

BDX-613-930(Rev.)/GA PC$3.25/MF$1.45
Bendix Corp., Kansas City, Mo.
EFFECTS OF MOISTURE UPON SPIRAL FLOW IN THERMOSET MOLDING COMPOUNDS.
J. M. Conway. Aug 73, 23p
Contract AT(29-1)-613

Descriptors: (*Molding, *Humidity), Cellulose, Fibers, Glass, Minerals, Phenols.

For abstract, see NSA 28 08, number 20602.

COM-73-50854/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
TESTS INDICATE VENTING INCREASES SMOKE FROM SOME POLYMERICS.
Final rept.,
A. F. Robertson. 1973, 2p
Pub. in Fire Eng., v126 n 97-98 Sep 73.

Descriptors: (*Cellulose, *Smoking), (*Plastics, Smoking), Venting, Fire fighting, Polymers, Flames.

The problem of voluminous smoke production during burning of plastic or polymeric materials is considered. Experimental data on smoke density resulting from both smouldering and flaming pyrolysis of cellulosic and polymeric sheet and foam materials are presented and compared. It is concluded that in general, although exceptions occur for specific materials, cellulosics produce much less smoke than polymerics under flaming exposure. The smoke production under smouldering exposure is roughly comparable for the two classes of materials. However, the polymeric materials show a marked increase of smoke production for flaming vs. smouldering while the converse is true for cellulosics. It is suggested that the fire fighting ventilation tactics developed and used for fires involving cellulosic materials may aggravate rather than ameliorate the problem of fighting fires involving polymeric materials.

COM-73-50886/3GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
A COMPILATION AND EVALUATION OF MECHANICAL, THERMAL, AND ELECTRICAL PROPERTIES OF SELECTED POLYMERS,
R. E. Schramm, A. F. Clark, and R. P. Reed. Sep 73, 848p NBS-MN-132
Sponsored in part by Atomic Energy Commission, Livermore, Calif. Library of Congress Catalog Card no. 72-600310.
Paper copy available from GPO $10.25 as stock no. 0303-01082.

Descriptors: (*Handbooks, *Polymers), (*Plastics, Handbooks), Mechanical properties, Electrical properties, Thermodynamic properties, Polychlorotrigeuoroethylene, Tetrafluoroethylene resins, Polyethylene, Bibliographies, Polycarbonate resins, Xylenes, Pyromellitic acid.

This compilation abstracts original experimental data on the mechanical, thermal, and electrical properties of six commercially available polymers. After an extensive review of the open literature, all available data were collected together in graphical and tabular form along with material characterization, experimental method, and reference to the original publication. The data are also summarized and a brief description of each polymer is included.

JAERI-M-4796/GA PC$4.00/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
AXIAL MIXING OF PARTICLES IN THE AGITATED MOVING-BED REACTOR FOR THE GAS-PHASE GRAFT COPOLYMERIZATION OF BUTADIENE TO POLYVINYL CHLORIDE POWDER.
K. Yoshida, K. Suzuki, H. Omichi, A. Sekiguchi, and Y. Yamashita. Apr 72, 31p
In Japanese. U.S. Sales Only.

Descriptors: (*Butadiene, *Chemical radiation effects), (*Pvc, Chemical radiation effects), Calibration, Cobalt 60, Gamma radiation, Graft polymers, Mixtures, Photon beams, Pilot plants, Powders, Prandtl number, Pulses, Radiation chemistry, Sampling, Signals, Stirring, Tracer techniques.

For abstract, see NSA 28 08, number 17992.

N73-30535/1GA PC$4.25/MF$1.45
North Dakota State Univ., Fargo. Dept. of Polymers and Coatings.
QUANTITATION OF BURIED CONTAMINATION BY USE OF SOLVENTS.
Semiannual Report, 1 Jan. - 30 Jun. 1973.
S. P. Pappas, P. Hsiao, and L. W. Hill. 30 Jun 73, 45p NASA-CR-133645
Contract NGR-35-001-012

Descriptors: *Amines, *Contaminants, *Decontamination, *Potting compounds, *Spores, Chemical reactions, Product development, Silicone resins, Spacecraft electronic equipment.

For abstract, see STAR 1121

N73-31836/2GA PC$3.25/MF$1.45
Defence Standards Labs., Maribyrnong (Australia).
THE COMBUSTION OF ORGANIC POLYMERIC MATERIALS, EVALUATION OF FLAMMABILITY BY THE OXYGEN INDEX METHOD.
J. R. Brown, and P. Dunn. Jun 73, 25p DSL-REPT-561

Descriptors: *Combustion, *Flammability, *Organic materials, *Oxygen, Navy, Nitrogen, Polymers.

For abstract, see STAR 1122

N73-31837/0GA PC$4.00/MF$1.45
Defence Standards Labs., Maribyrnong (Australia).
THE COMBUSTION OF ORGANIC POLYMERIC MATERIALS: SMOKE GENERATION.
J. R. Brown, and P. Dunn. Jun 73, 39p DSL-REPT-560

Descriptors: *Combustion, *Organic materials, *Smoke, Navy, Photometry, Polymers, Test chambers.

For abstract, see STAR 1122

PATENT-3 463 762/GA Not available NTIS
Whittaker Corp., Los Angeles, Calif.
POLYURETHANES FROM FLUOROALKYL PROPYLENEGLYCOL POLYETHERS.
Patent.
F. D. Trischler. Patented 26 Aug 69, 2p NASA-CASE-MFS-10506,
Misc-Filed 30 Dec. 1966. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Chemical reactions, *Diisocyanates, *Polyether resins, *Polyurethane resins, Organic materials, Patents, Synthetic resins.

A description is given of highly stable polyurethane polymers prepared by reacting a polyether with a diisocyanate. Compounded stocks of these polymers may be shaped and cured in conventional equipment used in the rubber industry. The solutions are dispersed gels prepared from the polymers and may be used for forming supported or unsupported films for coating fabrics or solid surfaces, and for forming adhesive bonds between a wide variety of plastics, elastomers, fabrics, metals, wood, leather, ceramics and the like.

SLA-73-521/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
AROMATIC POLYIMIDE MICROBALLOON SYNTACTIC FOAMS.
P. B. Rand. Jul 73, 15p

Descriptors: (*Foams, *Mechanical properties), (*Imides, *Polymers), Balloons, Density, Particle size, Tensile properties.

For abstract, see NSA 28 08, number 20644.

SLA-73-665/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
AC AND DC ELECTRICAL CHARACTERISTICS OF POLYTHERMALEZE-200 POLYIMIDE WIRE INSULATION INCLUDING EFFECTS OF POTTING IN EPON-828.
G. E. Pike, and C. H. Seager. Jun 73, 19p

Descriptors: (*Imides, *Electrical properties), (*Polymers, Electrical properties), (*Epoxides, Electrical properties), Alternating current, Capacitors, Dielectric materials, Direct current, Electric conductivity, Frequency dependence, Hz range, Khz range, Medium temperature, Mhz range, Temperature dependence.

For abstract, see NSA 28 07, number 17807.

UCID-15428/GA PC$3.75/MF$1.45
California Univ., Livermore. Lawrence Radiation Lab.
CREEP PROPERTIES OF PLASTICS FOAMS.
J. K. Lepper, N. W. Hetherington, and H. G. Hammon. 1968, 32p
Contract W-7405-eng-48

Descriptors: (*Polypropylene, *Creep), (*Urethane, Creep), (*Polystyrene, Creep), (*Plastic foams, Creep), Industry, Medium temperature.

For abstract, see NSA 28 08, number 20652.

11J. Rubbers

AD-768 714/8GA MF$1.45
Illinois Univ Urbana Dept of Theoretical and Applied Mechanics
THE DYNAMIC RESPONSE OF RUBBER - LIKE MATERIALS UNDER IMPACT LOADING.
Technical rept.,
George A. Costello, and James W. Phillips. Aug 73, 70p AMSWE-R-RR-T-3-68-73
Contract DAHC04-72-A-0001
Availability: Available in Microfiche only.

Descriptors: (*Synthetic rubber, Loading(Mechanics)), Butyl rubber, Silicone plastics, Impact tests, Mathematical models, Viscoelasticity, Elastomers, Computer programs, Rods.
Identifiers: Silicone resins.

Analyses and experiments were conducted to determine the dynamic response of rubber materials under impact loading. A mathematical model was developed that characterized the mechanical properties of the rubber bar material. The model is that standard linear model of linear viscoelasticity and is completely described by three parameters. The differential equations and boundary conditions that govern the response of the material to impact are presented and solved using the method of characteristics. Equations are derived to determine the energy loss of the method of characteristics. Equations are derived to determine the energy loss of the impacting projectile. Impact tests were conducted on the two different materials, Butyl 550 and Silicone G-46, and detailed test data is presented. (Modified author abstract)

N73-30538/5GA PC$3.50/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Propulsion Div.
LONG-TIME DYNAMIC COMPATIBILITY OF ELASTOMERIC MATERIALS WITH HYDRAZINE.
C. D. Coulbert, E. F. Cuddihy, and R. F. Fedors. 1 Sep 73, 28p NASA-CR-133794, JPL-TM-33-650
Contract NAS7-100

Descriptors: *Elastomers, *Hydrazines, *Long term effects, *Tensile tests, Liquid rocket propellants, Performance prediction, Reliability engineering, Rupturing, Strain rate, Temperature effects.

For abstract, see STAR 1121

11K. Solvents, Cleaners, and Abrasives

PATENT-3 498 768/GA Not available NTIS
Department of the Navy Washington D C
RUST-INHIBITIVE ABRASIVE BLASTING.
Patent,
Isidore Geld, Leo Deutsch, and Frank D'Oria.
Filed 18 Oct 67, patented 3 Mar 70, 2p Rept nos.
PAT-APPL-676 684,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Abrasives, *Patents), Corrosion inhibition, Abrasive blasting, Slags, Stearic acids, Carboxylic acids, Coatings.
Identifiers: PAT-CL-51-295.

The patent describes a method for preparing a rust-inhibitive abrasive material for cleaning metal surfaces by abrasive blasting. An aliphatic acid, such as stearic acid, is mixed with the abrasive material, such as black slag particles, at room temperature. The mixture is heated to a temperature which melts the aliphatic acid and then cooled to room temperature, the mixture being continuously stirred while cooling. The process produces dry, granular abrasive particles which are coated with a film of fatty acid.

PATENT-3 498 922/GA Not available NTIS
Department of the Navy Washington D C
METHOD OF DISPLACING LIQUID ORGANIC FILMS FROM SOLID SURFACES.
Patent,
William A. Zisman, and Marianne K. Bernett.
Filed 18 Oct 66, patented 3 Mar 70, 2p Rept nos.
PAT-APPL-588 256,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Cleaning), (*Electrical equipment, *Cleaning), Organic compounds, Films, Silicones, Displacement reactions.
Identifiers: PAT-CL-252-171, Siloxanecopolymers/dimethyl.

The patent describes a method of displacing liquid organic films from solid surfaces by the application thereto of a nonaqueous liquid surface-active composition. The composition is a solution of a small amount of a high molecular weight linear dimethyl silicone (molecular weight 1200 to 15,000) in a low molecular weight silicone from the dimer ghrough the octamer. Particular applications of the method are in the cleaning of oily films from solid surfaces of electrical equipment, such as electric motors, and electronic equipment.

PATENT-3 498 923/GA Not available NTIS
Department of the Navy Washington D C
SURFACE-ACTIVE COMPOSITIONS AND METHOD FOR DISPLACING LIQUID ORGANIC FILMS FROM SOLID SURFACES.
Patent,
William A. Zisman, and Marianne K. Bernett.
Filed 18 Oct 66, patented 3 Mar 70, 2p Rept nos.
PAT-APPL-588 260,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Cleaning), (*Electrical equipment, *Cleaning), Oils, Displacement reactions, Silicones, Organic compounds.
Identifiers: PAT-CL-252-171, Nonadecanoic acid/pentafluoro, Dodecanoic acid/pentafluoro, Silane copolymer/dimethyl, Naphthas.

The patent describes a nonaqueous liquid surface-active composition for displacing liquid organic films from solid surfaces. The composition is a solution of a small amount of a partially fluorinated long-chain alkyl monocarboxylic acid in a solvent which may be an aliphatic naphtha of minimum flash point from about 108 to 140 degrees F. or a low molecular weight dimethyl silicone.

PATENT-3 516 938/GA Not available NTIS
Department of the Navy Washington D C
DISPLACING ORGANIC LIQUIDS FROM SOLID SURFACES.
Patent,
William A. Zisman, and Marianne K. Bernett.
Filed 18 Oct 66, patented 23 Jun 70, 3p Rept nos.
PAT-APPL-588 259,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, Surface-active substances), (*Surface-active substances, *Organic solvents), (*Silicones, Surface-active substances), (*Halogenated hydrocarbons, Surface-active substances), Films, Fluorine compounds, Aliphatic compounds, Cleaning compounds.

Identifiers: PAT-CL-252-171, Displacement, Fluoroalkanes.

The patent describes a nonaqueous liquid surface-active composition for displacing liquid organic films from solid surfaces. The composition is a solution of a silicone solute in a pair of volatile co-solvents in which the solute and one of the co-solvents are active displacing agents. The solute may be a low molecular weight dimethyl silicone, a liquid linear polyoxyalkylated dimethyl silicone or a fluorosilicone. The co-solvent which is an active displacing agent is a volatile liquid perfluoroalkane or fully fluorinated bromo- or chloroalkane. The other co-solvent is an aliphatic naphtha.

PB-224 631/2GA PC$4.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF DOW CHEMICAL COMPANY - OVEN CLEANER.
17 Nov 72, 37p FTC-722-3194/Dow-oven

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Cleaning agents, Ovens, Sodium hydroxide, Surfactants, Fumes, Ethers, Efficiency.
Identifiers: *Truth in advertising, Dow Chemical Company, Lemon Fresh Dow oven cleaner.

Documentation is submitted in support of various claims concerning the superiority of Lemon Fresh Dow Oven Cleaner and its lack of eye-stinging or choking fumes. Portions of this document are not fully legible.

PB-224 633/8GA PC$5.25/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF DOW CHEMICAL COMPANY. - BATHROOM CLEANER.
25 Aug 72, 62p FTC-722-3194/Dow-Bath

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Cleaning agents, Efficiency, Emulsifying agents, Surfactants.
Identifiers: *Truth in advertising, Dow Chemical Company, Dow bathroom cleaner.

Documentation is submitted in support of various claims concerning the scrbbing action and cleaning efficacy of Dow Bathroom Cleaner. Portions of this document are not fully legible.

PB-224 637/9GA PC$3.50/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF ANDREW JERGENS COMPANY.
13 Nov 72, 29p FTC-722-3194/Jergens

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Skin protective agents), Moisture content, Skin(Anatomy), Moisture regain, Formulations, Effectiveness.
Identifiers: *Truth in advertising, Andrew Jergens Company, Jergens extra dry facial cleanser.

Documentation is submitted in support of various claims concerning the moisturizer content of Jergens Extra Dry Facial Cleanser and the fact it is 'something new.'

PB-224 648/6GA PC$3.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF A. E. STALEY MANUFACTURING COMPANY.
16 Aug 72, 12p FTC-722-3194/Staley

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Fabrics, Softening, Washing machines, Laundry.
Identifiers: *Truth in advertising, AE Staley Manufacturing Company, Sta-Puf fabric softener, *Fabric softeners.

Documentation is submitted in support of various claims concerning the efficiency of Sta-Puf Fabric Softener and the identities of competitive products with which it has been compared.

PB-224 649/4GA PC$4.25/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF SHELCO COMPANY.
10 Nov 72, 44p FTC-722-3194/Shelco

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, *Cleaning agents), Ovens, Cleaning, Fumes, Sodium hydroxide, Toxicity.
Identifiers: *Truth in advertising, Shelco Company, Jifoam oven cleaner, *Oven cleaners.

Documentation is sumbitted in support of various claims concerning the mildness of odor and amount of fumes given off by Jifoam Oven Cleaner; and the identities of related competitive products with which Jifoam has been compared.

PB-224 657/7GA PC$4.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF S.C. JOHNSON AND SON, INC.
25 Aug 72, 36p FTC-722-3194/Johnson

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Fabrics, Softening, Efficiency, Washing machines, Laundry.
Identifiers: *Truth in advertising, *Fabric softeners, SC Johnson and Son Incorporated, Rain Barrel fabric softener.

Documentation is submitted in support of various claims concerning laundry softening effects of and laboratory tests on Rain Barrel Fabric Softener.

PB-224 658/5GA PC$4.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF NOXELL CORPORATION.
7 Sep 72, 36p FTC-722-3194-Noxell

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Skin protective agents), Moisture content, Skin(Anatomy), Moisture regain, Cleaning, Effectiveness, Formulations.
Identifiers: *Truth in advertising, Noxell Corporation, Noxema skin cream.

Documentation is submitted in support of various claims concerning the moisturizing and greaseless characteristics and cleaning efficacy of Noma Skin Cream.

PB-224 659/3GA PC$3.25/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF RED DEVIL, INC.
14 Sep 72, 23p FTC-722-3194/Red Devil

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Soaps), Detergents, Lanolin, Dirt, Removal, Efficiency, Aerosols, Cleaning agents.
Identifiers: *Truth in advertising, Red Devil Incorporated, Red Devil aerosol hand cleaner.

Documentation is submitted in support of various claims concerning the content of lanolin, dirt-removing efficacy, and water-free utility of Red Devil Aerosol Hand Cleaner.

PB-224 660/1GA PC$5.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF CLOROX COMPANY.
9 Nov 72, 60p FTC-722-3194/Clorox

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, *Bleaching agents), Efficiency, Disinfectants, Bactericides, Viruses, Fungi, Bacteria.
Identifiers: *Truth in advertising, Clorox company, Clorox liquid bleach.

Documentation is submitted in support of various claims concerning the superior virucidal and germicidal effect of Clorox on odor-causing organisms; the identifications of the other household disenfectants with which Clorox has been compared. Portions of this document are not fully legible.

PB-224 663/5GA PC$3.25/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF AMERICAN HOME PRODUCTS CORPORATION.
27 Nov 72, 22p FTC-722-3194/AHPC

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Soaps), Cleaning agents, Ovens, Sodium hydroxide, Hydrolysis, Efficiency.
Identifiers: *Truth in advertising, American Home Products Corporation, Easy Off oven cleaner, *Oven cleaners.

Documentation is submitted in support of various claims concerning the efficacy and ingredients contained in Easy Off Oven Cleaner. Portions of this document are not fully legible.

PB-224 664/3GA PC$3.25/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF COLGATE-PALMOLIVE COMPANY.
15 Nov 72, 24p FTC-722-3194/Colgate

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Soaps), Deodorizing, Bactericides, Odor control, Efficiency, Dishwashing compounds, Safety.
Identifiers: *Truth in advertising, Colgate-Palmolive Company, Irish Spring soap, Palmolive crystal clear dishwasher.

Documentation is submitted in support of various claims concerning the uniqueness of double deodorant system used in Irish Spring; long-lasting effects of Irish Spring in eliminating axillary odor; efficacy of Palmolive Crystal Clear in removing eggs, grease, film and dried-on food; safety of Palmolive Crystal Clear for fine china and crystal and a definition of safe. Portions of this document are not fully legible.

PB-224 665/0GA PC$5.75/MF$1.45
Federal Trade Commission, Washington, D.C.

FTC ADVERTISING SUBSTANTIATION PROGRAM e SOAPS AND DETERGENTS DOCUMENTATION OF MORTON-NORWICH PRODUCTS, INC., JANITOR-IN-A-DRUM.
3 Nov 72, 72p FTC-722-3194/Morton-JD

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Cleaning agents, Surfactants, Strength, Cleaning, Efficiency, Wetting agents.
Identifiers: *Truth in advertising, Morton-Norwich Products Incorporated, Janitor-in-a-Drum.

Documentation is submitted in support of various claims concerning the strength and cleaning efficacy of Janitor-in-a-Drum. Portions of this document are not fully legible.

PB-224 666/8GA PC$6.75/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAP AND DETERGENTS DOCUMENTATION OF CPC INTERNATIONAL INC.
18 Aug 72, 94p FTC-722-3194/CPA

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Efficiency, Fabrics, Softening, Formulations, Laundry.
Identifiers: *Truth in advertising, CPC International Incorporated, NuSoft fabric softener, *Fabric softeners.

Documentation is submitted in support of various claims concerning recommendations made by Wrangler Sportswear regarding NuSoft fabric softener; percentage of softeners contained in NuSoft compared with all other national brands of fabric softeners; NuSoft's efficacy at smoothing away wrinkles and cutting down on ironing; formulation of NuSoft fabric softener. Portions of this document are not fully legible.

PB-224 667/6GA PC$6.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF CALGON CONSUMER PRODUCTS COMPANY, INC.
25 Aug 72, 80p FTC-722-3194/Calgon

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Dishwashing compounds, Surfactants, Formulations, Cleaning, Efficiency.
Identifiers: *Truth in advertising, Calgon Consumer Products Company, Calgonite.

Documentation is sumbitted in support of various claims concerning the unique formulation of Calgonite which breaks up tough stains and why such formulation is unique. Portions of this document are not fully legible.

PB-224 668/4GA PC$3.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF KNOMARK, INC.
25 Aug 72, 11p FTC-722-3194/Knomark

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Cleaning agents), Toilet facilities, Effectiveness, Formulations, Strength, Safety, Cleaning.
Identifiers: *Truth in advertising, Knomark Incorporated, Ty-D-bol toilette bowl cleaner, *Toilet bowl cleaners.

Documentation is submitted in support of various claims concerning the strength, content safety and cleaning efficacy of Ty-D-bol toilette bowl cleaner. Portions of this document are not fully legible.

PB-224 669/2GA PC$3.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF DAYS-EASE HOME PRODUCTS CORPORATION.
18 Aug 72, 14p FTC-722-3194/Days-Ease

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Cleaning agents), Effectiveness, Formulations, Chelating agents, Alkalinity, Toilet facilities, Cleaning.
Identifiers: *Truth in advertising, Days-Ease Home Products Corporation, Days-Ease Automatic Bowl Cleaner, Toilet bowl cleaners.

Documentation is submitted in support of various claims concerning use of Days-Ease Automatic Bowl Cleaner in over 30 million bathrooms; length of effectiveness; relative cleaning performance; identity and content of lemon-scented room freshener. Portions of this document are not fully legible.

PB-224 676/7GA PC$4.50/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF GOLD SEAL COMPANY.
15 Nov 72, 49p FTC-722-3194/GS

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Soaps), Surfactants, Formulations, Sulfonates, Baths.
Identifiers: *Truth in advertising, Sold Seal Company, Mr Bubble bubble bath soap.

Documentation is submitted in support of various claims concerning the cleaning efficacy of Mr. Bubble Bubble Bath soap and statements that it does not leave rings in bathtubs after bathing.

PB-224 708/8GA PC$11.75/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF LEVER BROTHERS COMPANY - WISK, LUX LIQUID, DISHWASHER ALL, COLD WATER ALL, ALL LAUNDRY DETERGENT, DOVE-FOR-DISHES, AND DOVE BAR.
28 Aug 72, 194p FTC-722-3194-Lever-Wisk

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Soaps), Formulations, Effectiveness, Cleaning.
Identifiers: *Truth in advertising, Lever Brothers Company, Wisk, Lux Liquid, Dishwasher All, Cold Water All, All laundry detergent, Dove Bar, Dove for Dishes.

Documentation is submitted in support of various claims concerning the comparative performance and cleaning efficacy of Wisk; exclusive formulation of Lux Liquid; the content of Dishwasher All; cleaning efficacy and phosphate content of Cold Water All; cleaning efficacy and performance comparision of All Laundry Detergent; and improvements to Dove-for-Dishes, and content of Dove Bar. Portions of this document are not fully legible.

PB-224 710/4GA PC$9.50/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF AMERICAN HOME PRODUCTS CORPORATION.
5 Sep 72, 147p FTC-722-3194-Am Home

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Bactericides, Toilet facilities, Cleaning, Effectiveness, Deodorizing, Safety, Surfactants.
Identifiers: *Truth in advertising, American Home Products Corporation, Sani Flush, *Toilet bowl cleaners, Woolite.

Documentation is submitted in support of various claims concerning the deodorizing, stain removing, and germicidal efficacy of Sani-Flush; and the safety from shrinking, fading, and stretching of Woolite and its recommendations by manufacturers of over 30 million garments from wool to synthetics. Portions of this document are not fully legible.

PB-224 711/2GA PC$14.50/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF COLGATE-PALMOLIVE COMPANY.- AJAX LAUNDRY DETERGENT, COLD POWER, FAB, PALMOLIVE GOLD, AJAX LIQUID, AND AJAX DISHWASHING LIQUID.
15 Aug 73, 247p FTC-722-3194/Colgate-A

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Washing, Laundry, Softening, Fabrics, Dishwashing compounds, Effectiveness.
Identifiers: *Truth in advertising, Colgate Palmolive Company, Ajax laundry detergent, Cold Power, Fab, Palmolive Gold, Ajax Liquid, Ajax dishwashing liquid, Palmolive dishwashing liquid.

Documentation is submitted in support of various claims concerning Ajax Laundry Detergent new whitening and brightening system; reduction in amount of phosphate in Ajax Laundry Detergent; statement that clothes last longer when washed in Ajax Laundry Detergent than in other competitive brands; the amount of grease remover in Ajax Laundry Detergent that clothes last longer when washed in Cold Power than in competitive products; the cleaning efficacy of Cold Power; the freshness of clothes washed in Fab; the all-fabric brighteners used in Fab; the deodorant and skin-softening ingredient content and germicidal efficacy of Palmolive Gold; amount and strength of ammonia used in Ajax Liquid; cleaning efficacy of Ajax Liquid; cleaning efficacy and lasting ability of Ajax Dishwashing Liquid; sudsing ability of Palmolive Dishwashing Liquid and its softening claims. Portions of this document are not fully legible.

PB-224 712/0GA PC$3.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF LEVER BROTHERS COMPANY--LIFEBUOY.
14 Nov 72, 20p FTC-722-3194-Lever-LB

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Mnaufacturers, Soaps), Baths, Deodorizing, Effectiveness, Formulations.
Identifiers: *Truth in advertising, Lever Brothers Company, Lifebuoy soap.

Documentation is submitted in support of various claims concerning the lasting capabilities and comparative performance of Lifebuoy Soap Bar. Portions of this document are not fully legible.

PB-224 713/8GA PC$10.25/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF THE CLOROX COMPANY. CLOROX 2.
14 Aug 72, 163p FTC-722-3194/Clorox 2

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Bleaching agents), Formulations, Cleaning, Effectiveness, Stains, Removal.

Identifiers: *Truth in advertising, Chlorox Company, Chlorox liquid bleach, Formula 409, Chlorox 2.

Documentation is submitted in support of various claims concerning the effectiveness of demonstration detergents at removing stains and sweat when compared to Clorox; the cleaning efficacy of Clorox 2; the lack of adverse effects of Clorox 2 in cleaning and brightening all fabrics; performance of Clorox 2 compared with regular Clorox; the dirt removing efficacy of Formula 409. Portions of this document are not fully legible.

PB-224 714/6GA PC$12.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF UNITED STATES BORAX AND CHEMICAL CORPORATION.
15 Nov 72, 197p FTC-722-3194-Borax

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Cleaning agents), Cleaning, Effectiveness, Clothing, Stains.
Identifiers: *Truth in advertising, United States Borax and Chemical Corporation, Borateem.

Documentation is submitted in support of various claims concerning the amount of Borateem needed for maximum cleaning efficacy; identity of stains which Borateem can effectively remove; and how Borateem effectively prolongs the wearing life of clothes.

PB-224 718/7GA PC$22.75/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF STERLING DRUG, INC.
7 Sep 72, 411p FTC-722-3194/Sterling

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Soaps), Bactericides, Effectiveness, Formulations, Disinfectants, Gynecology, Obstetrics.
Identifiers: *Truth in advertising, Sterling Drug Incorporated, pHisoHex.

Documentation is submitted in support of various claims concerning the manufacture of pHisoHex especially to satisfy medical standards; the bactericidal efficacy, content, lasting effects and recommendations by medical authorities of pHisoHex. Portions of this document are not fully legible.

PB-224 719/5GA PC$3.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF PROCTER AND GAMBLE COMPANY--TIDE LAUNDRY DETERGENT.
17 Nov 72, 10p FTC-722-3194-Procter-TLD

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Formulations, Effectiveness, Clothing, Cleaning.
Identifiers: *Truth in advertising, Procter and Gamble Company, Tide laundry detergent.

Documentation is submitted in support of various claims concerning the cleaning efficacy of Tide Laundry Detergent in restoring apparently ruined clothing.

PB-224 720/3GA PC$12.25/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF THE DRACKETT COMPANY (A SUBSIDARY OF BRISTOL MYERS COMPANY).
18 Aug 73, 202p FTC-722-3194-Dracket

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Cleaning agents), Disinfectants, Cleaning, Effectiveness.
Identifiers: *Truth in advertising, Drackett Company, Vanish toilette bowl cleaner.

Documentation is submitted in support of various claims concerning the dissolving and germicidal efficacy of Vanish Toilette Bowl Cleaner; statements concerning the 'Boilin' clean' action of Vanish. Portions of this document are not fully legible.

PB-224 721/1GA PC$11.75/MF$1.45
Federal Trade Commission, Washington, D.C.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF PUREX CORPORATION, LTD.
3 Nov 72, 192p FTC-722-3194/Purex

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Cleaning agents), Formulations, Cleaning, Effectiveness, Bleaching agents.
Identifiers: *Truth in advertising, Purex Corporation Ltd, Brillo household cleaner, Purex bleach.

Documentation is submitted in support of various claims concerning strength, relative cleaning performance and ammonia content of Brillo Household Cleaner; comparative performance and cleaning efficacy of Purex Bleach. Portions of this document are not fully legible.

PB-224 722/9GA PC$5.75/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF ECONOMICS LABORATORY, INC.
22 Aug 73, 71p FTC-722-3194-Econ Lab

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Kitchen equipment and supplies, Cleaning, Effectiveness.
Identifiers: *Truth in advertising, Economics Laboratory Incorporated, Finish dishwashing detergent, Electrasol dishwashing detergent, Jet dry.

Documentation is submitted in support of various claims concerning content and pre-wash efficacy of Finish dishwashing detergent; content and cleaning efficacy of Electrasol dishwashing detergent; 'sheeting effect' of Jet Dry and discussion of the claim that water spots form after the detergent has been washed down the drain. Portions of this document are not fully legible.

PB-224 723/7GA PC$9.25/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF MORTON-NORWICH PRODUCTS, INC.--K2R.
8 Sep 72, 144p FTC-722-3194-Morton-K2r

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Cleaning, Stains, Formulations, Effectiveness.
Identifiers: *Truth in advertising, Morton-Norwich Products Incorporated, Spray-n Wash, K2r spot lifter, Fantastik.

Documentation is submitted in support of various claims concerning the cleaning efficacy of Spray 'n Wash; the cleaning efficacy of K2r Spot Lifter; why K2r is referred to as a spot lifter; and its claim that it never leaves a ring; cleaning efficacy of Fantastik with regards to grease and grime. Portions of this document are not fully legible.

PB-224 724/5GA PC$4.50/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF MILES LABORATORIES, INC.
14 Aug 72, 47p FTC-722-3194-Miles

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), Manufacturers, Formulations, Cleaning, Effectiveness.
Identifiers: *Truth in advertising, Miles Laboratories Incorporated, SOS Steel Wool soap pads.

Documentation is submitted in support of various claims concerning the new formulation, comparative information, suds-lasting ability, soap content, and cleaning efficacy of S.O.S. Steel Wool Soap Pads.

PB-224 745/0GA PC$23.50/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF CHURCH AND DWIGHT CO., INC.
2 Nov 72, 429p FTC-722-3194-A/H

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Cleaning agents), Formulations, Purity, Alkalinity, Solubility.
Identifiers: *Truth in advertising, Church and Dwight Company Incorporated, Arm and Hammer baking soda, *Baking soda.

Documentation is submitted in support of various claims concerning statements as to the purity and naturalness of Arm and Hammer Brand Baking Soda; its lack of chemical odor; its ability to sweeten naturally and a definition of 'naturally;' its non-scratching characteristics. Portions of this document are not fully legible.

PB-224 755/9GA PC$6.50/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF SEARS, ROEBUCK AND CO.
25 Aug 72, 89p FTC-722-3194-Sears

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Detergents), Formulations, Enzymes, Cleaning, Laundry.
Identifiers: *Truth in advertising, Sears Roebuck and Company, Sears phosphate free laundry detergent.

Documentation is submitted in support of various claims concerning the cleaning efficacy of Sears Phosphate-Free Laundry Detergent with no phosphates, Nitrilotriacetic acid, or enzymes.

PB-224 756/7GA PC$5.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF GENERAL FOODS CORPORATION.
16 Aug 73, 56p FTC-722-3194-Gen Foods

Descriptors: (*Soap, *Publicity), (*Detergents, Publicity), (*Manufacturers, Cleaning agents), Effectiveness, Formulations, Laundry, Brightness, Color.
Identifiers: *Truth in advertising, General Foods Corporation, La France whitener.

Documentation is submitted in support of various claims concerning the color-retaining efficacy, performance, safety, and gentleness of La France whitener-brightener.

PB-224 757/5GA PC$4.00/MF$1.45
Federal Trade Commission, Washington, D.C.

FTC ADVERTISING SUBSTANTIATION PROGRAM--SOAPS AND DETERGENTS DOCUMENTATION OF AMERICAN CYANAMID COMPANY.
25 Aug 72, 38p FTC-722-3194-Cyanamid

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Cleaning agents), Disinfectants, Cleaning, Effectiveness.
Identifiers: *Truth in advertising, American Cyanamid Company, Pine-Sol cleaner-disinfectant.

Documentation is submitted in support of various claims concerning the germicidal effect of Pine Sol and its efficacy in cleaning any thing dirty that happens.

PB-224 758/3GA PC$10.00/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM - SOAPS AND DETERGENTS DOCUMENTATION OF PROCTER AND GAMBLE COMPANY.
22 Aug 72, 160p FTC-722-3194-Proctor

Descriptors: (*Soaps, *Publicity), (*Detergents, Publicity), (*Manufacturers, Soaps), Formulations, Effectiveness, Cleaning, Bactericides, Deodorizing.
Identifiers: *Truth in advertising, Procter and Gamble Company, Spic-and-Span, All-Temperature Cheer, Safeguard deodorant soap, Top Job, Dreft, Comet cleanser, Zest, Dash laundry detergent, Ivory liquid, Thrill dishwashing liquid, Cascade dishwasher detergent, Bold laundry detergent, Mr. Clean, Ivory soap, Oxydol laundry detergent, Downy fabric softner, Joy dishwashing detergent, Camay beauty cleanser.

Documentation is submitted in support of various claims concerning the cleaning efficacy and comparative performance of Spic and Span; cleaning efficacy and performance comparasions of All-Temperature Cheer; antibacterial efficacy and comparative performance of Safeguard Deodorant Soap; grease cutting efficacy and comparative performance of Top Job; softening characteristics of Ivory Snow with regard to diapers; ammonia removing efficacy of Dreft; stain removing efficacy and comarative performance of Comet Cleanser; lathering filming cleaning and deodorant characteristics of Zest; ingredients and cleaning efficacy of Dash compared with other products; lasting and cosmetic and cleaning characteristics of Ivory Liquid; peaches and cream complexions and mildness of Thrill, sheeting action of Cascade; content, formulation and cleaning efficacy of Bold, cleaning efficacy of Mr. Clean; purity of and recommendation for Ivory Soap; cleaning and bleaching efficacy of Oxydol; cleaning and freshening characteristics of Downy, Joy, and Camay Cosmetic Cleanser.

11L. Wood and Paper Products

AD-768 727/0GA PC$2.75/MF$1.45
Forest Products Lab Madison Wis
A TREATMENT THAT SHOWS PROMISE FOR PRESERVING STORED WOOD CHIPS.
Forest Service research paper,
E. L. Springer, L. L. Zoch, Jr., W. C. Feist, and G. J. Hajny. 1973, 5p Rept no. FSRP-FPL-216

Descriptors: (*Wood, *Pesticides), Thiols.
Identifiers: 2-Mercaptobenzothiazole/sodium salt, Carbamic acid/dithio-hydrozymethyl-methyl(Potassium salt).

Treating fresh aspen chips with an aqueous solution of 0.20 percent potassium N-methyl, N-hydroxymethyldithiocarbamate and 0.05 percent sodium 2-mercaptobenzothiazole has been shown in a laboratory storage environment to be effective in preventing heating, loss in brightness, and growth of micro-organisms in the chips. The results warrant further evaluation of this treatment for preventing deterioration of wood chips during outdoor storage.

PB-224 781/5GA PC$3.00/MF$1.45
Western Forest Products Lab., Vancouver (British Columbia).
A COMPUTER PROGRAM FOR RESOLVING THE (040) DIFFRACTION PEAK AND CALCULATING THE MEAN MICROFIBRIL ANGLE OF WOOD,
Ricardo O. Foschi, and M. Lotfy M. El-osta. Aug 73, 20p VP-X-114

Descriptors: (*Wood fibers, X ray diffraction), X ray analysis, Computer programs, FORTRAN, Canada.
Identifiers: FORTRAN 4 programming language, IBM 360/67 computers.

A computer program written in FORTRAN 4 is presented. The program fits the mathematical model to X-ray azimuthal intensities obtained at 2(theta) approximately = to 34.5 degrees and then resolves the (040) diffraction profile from which the mean microfibril angle of wood can be calculated directly. (Author)

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-768 361/8GA PC$3.00/MF$1.45
North Carolina Univ Chapel Hill Dept of Statistics
ON EXTREME VALUES IN STATIONARY SEQUENCES.
Technical rept.,
M. R. Leadbetter. Aug 73, 37p Rept no. Mimeo Ser-886
Contract N00014-67-A-0321-0002

Descriptors: (*Stochastic processes, Theorems), Sequences, Random variables, Distribution functions, Correlation techniques.
Identifiers: Order statistics, Stationary processes, Extreme value problem.

Extreme value theory is considered for stationary sequences (xi sub n) satisfying dependence restrictions significantly weaker than strong mixing. In particular the basic theorem of Gnedenko (developed later by Loynes for mixing sequences) is proved under the weak restrictions. The conditions for the general results are shown to apply to stationary normal sequences under the very weak covariance assumptions used previously (e.g. by S.M. Berman). Distributional limit theorems for other order statistics are also obtained. (Author)

AD-768 362/6GA PC$2.75/MF$1.45
North Carolina Univ Chapel Hill Dept of Statistics
LOCATING THE MAXIMUM OF A STATIONARY NORMAL PROCESS.
Technical rept.,
Malcolm R. Leadbetter. Aug 73, 10p Rept no. Mimeo Ser-887
Contract N00014-67-A-0321-002

Descriptors: (*Stochastic processes, Asymptotic series), Random variables, Distribution functions, Theorems.
Identifiers: Stationary processes.

The purpose of the paper is to describe certain results concerning the location (L sub T) of the maximum of a stationary normal process in the time O < or = t < or = T. It is shown that (L sub T) does not, in general, have a uniform distribution on O < or = t < or = T, but is asymptotically so under weak conditions as T nears infinity. The various features of the corresponding discrete time problem are also discussed. (Author)

AD-768 366/7GA PC$3.75/MF$1.45
California Univ Berkeley Dept of Statistics
ASYMPTOTIC LINEARITY OF WILCOXON SIGNED-RANK STATISTICS,
Andre Antille. 11 Sep 73, 31p
Contract N00014-69-A-0200-1038

Descriptors: (*Statistical tests, Asymptotic series), Regression analysis, Random variables, Stochastic processes, Probability density functions, Measure theory, Theorems.
Identifiers: *Wilcoxon signed rank test, Normal density functions, Weak convergence.

In an earlier paper the author proved that a stochastic process related to a special Wilcoxon signed-rank statistic converges weakly to a linear process. In this paper it is shown that this property still applies to more general processes, more precisely to processes derived from Wilcoxon signed-rank statistics in the case of linear regression with one parameter. (Author)

AD-768 367/5GA PC$5.75/MF$1.45
California Univ Berkeley Dept of Statistics
ASYMPTOTIC EXPANSIONS FOR M-ESTIMATORS.
Doctoral thesis,
Jose Norberto, and Walter Dachs. 11 Sep 73, 72p
Contract N00014-69-A-0200-1038

Descriptors: (*Statistical analysis, Asymptotic series), Statistical distributions, Analysis of variance, Monte Carlo method, Measure theory, Partial differential equations, Integration, Theses.
Identifiers: Robust procedures, Parameter estimation, Maximum likehood estimation, Normal density functions.

An asymptotic expansion for the distribution of M-estimators in the case of scale known, but with different basic assumptions, so as to include some of the M-estimators originally proposed. Also, a formal expansion for the case of scale unknown. Finally, several numerical results comparing, in part, values obtained with the Monte Carlo results of work done in Princeton.

AD-768 370/9GA PC$2.75/MF$1.45
IBM Thomas J Watson Research Center Yorktown Heights N Y
SOME ALGORITHMS FOR ANALYZING TRIVALENT PLANTED TREES.
Technical rept.,
J. S. Smart, and C. Werner. Sep 73, 21p Rept no. TR-11
Contract N00014-70-C-0188

Descriptors: (*Graphics, Theorems), Topology, Networks, Algorithms, Rivers, Mathematical models.
Identifiers: Trees(Mathematics), Graph theory, *Geomorphology, Network flows.

Some algorithms for analyzing trivalent planted trees are presented. These algorithms are all based on a binary string representation of the network and include procedures for determining path lengths, diameters, and aggregate properties of subnetworks. A method is described for randomly generating a trivalent planted tree with a specified number of links in such a way that each topologically distinct network with that number of links has the same probability of occurring. (Author)

AD-768 383/2GA PC$15.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
AN APPLICATION OF OBSERVERS TO LINEAR SYSTEMS WITH REDUCED STATE MEASUREMENT.
Master's thesis,
Charles F. Pritzlaff. Jun 73, 265p Rept no. GGC/EE/73-14

Descriptors: (*Adaptive control systems, Mathematical models), Linear systems, Feedback, Matrix algebra, Curve fitting, Graphics, Computer programs, Algorithms, Theses.

Identifiers: *Control theory, Time invariant systems, Feedback control, Computer aided design, Kalman filters.

The problem considered in the report was the synthesis of control laws when all states of a system could not be measured. The study was restricted to linear, deterministic, and time-invariant systems. The problem was solved by the design of observer systems to estimate a linear functional of the full-state feedback control. Three distinct algorithms for designing an observer were tested. The first was a direct solution of the observer design equations and involved setting as many gains as possible to unity. The second algorithm minimized a cost function which was related to the magnitudes of the gains associated with the observer system. The final algorithm was designed to minimize the effect of known errors in the basic state equations on the accuracy of the observer design. (Modified author abstract).

AD-768 387/3GA PC$4.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
NEARLY BEST UNBIASED LINEAR ESTIMATORS OF THE LOCATION AND SCALE PARAMETERS OF THE NORMAL DISTRIBUTION BY USE OF ORDER STATISTICS.
Master's thesis,
Frederic Leander Bonney. Dec 68, 441p Rept no. GRE/MATH/68-1

Descriptors: (*Sampling, Statistical distributions), (*Statistical distributions, Tables), Analysis of variance, Probability density functions, Population(Mathematics), Mathematical prediction, Tables, Theses.
Identifiers: *Order statistics, Parameter estimation, *Normal density functions, Mean.

Given as ordered sample from a normal distribution, the location and scale parameters can be estimated by use of the coefficients tabled in the thesis. These coefficients used with ordered sample will give the nearly best unbiased linear estimators of the location and scale parameters for sample sizes ranging from fifteen to forty. Both single and double censoring are included. (Author)

AD-768 388/1GA PC$15.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
NEARLY-BEST LINEAR CONDITIONAL UNBIASED ESTIMATION OF THE LOCATION AND SCALE PARAMETERS OF THE WEIBULL PROBABILITY DISTRIBUTION BY THE USE OF ORDER STATISTICS.
Master's thesis,
Robert I. Davis. Dec 69, 259p Rept no. GRE/MATH/69-1

Descriptors: (*Sampling, Probability density functions), Random variables, Analysis of variance, Statistical distributions, Approximation(Mathematics), Tables, Theses.
Identifiers: *Weibull density functions, *Order statistics, Parameter estimation, Lagrange multipliers.

A table of coefficients for nearly-best linear conditional unbiased estimation of the location and scale parameters of the Weibull probability distribution is given. The shape parameter is assumed to be known. The theory of order statistics and the method of Lagrange multipliers are used to obtain coefficients for complete ordered samples and for the same ordered samples censored from above. Relative efficiencies of the nearly-best estimators with respect to the best estimators are greater than 77.715 per cent for all cases examined. The coefficients can be used also for simultaneous estimation of the location and scale parameters. (Author)

AD-768 482/2GA Reprint
California Univ Santa Barbara Dept of Mathematics
ON THE SINGULAR VALUES OF MATRIX PRODUCTS - I,
R. C. Thompson, and S. Therianos. 30 Jun 70, 13p AFOSR-TR-73-1897
Grant AF-AFOSR-698-67
See also Paper 3 dated 1 Dec 70, AD-767 740.
Availability: Pub. in Scripta Mathematica, v29 nos 1-2 p99-110. n.d.

Descriptors: (*Matrix algebra, *Inequalities), Vector spaces, Theorems.
Identifiers: Hermitian matrices, Eigenvalues.

The paper establishes inequalities for singular values of matrix products analogous to already known inequalities for the eigenvalues of sums of Hermitian matrices. (Author)

AD-768 483/0GA Reprint
University of Southern California Los Angeles Electronic Sciences Lab
FEEDBACK REGULATORS FOR JUMP PARAMETER SYSTEMS WITH STATE AND CONTROL DEPENDENT TRANSITION RATES,
David D. Sworder, and Vernon G. Robinson. 20 Jan 72, 7p AFOSR-TR-73-1942
Grants AF-AFOSR-1622-69, NSF-GK-33847
Revision of report dated 26 Apr 72.
Availability: Pub. in the IEEE Transactions on Automatic Control, vAC-18 n4 p355-360 Aug 73.

Descriptors: (*Adaptive control systems, Mathematical models), Linear systems, Stochastic processes, Economics, Feedback, Optimization.
Identifiers: *Control theory, Stochastic control, Markov processes, Parameter estimation, Regulators.

A class of linear, stochastic, jump parameter systems is studied in which the probability law of the parameter processes depends upon the control policy used. An optimal controller is given when the loss function is quadratic. Because of difficulties inherent in the design equations, a more easily evaluated, near optimal controller is provided for problems in which the parameter processes are weakly dependent on the control policy. (Author)

AD-768 509/2GA Reprint
California Univ Santa Barbara Dept of Mathematics
ON THE SINGULAR VALUES OF MATRIX PRODUCTS. II,
R. C. Thompson. 30 Jun 70, 5p AFOSR-TR-73-1896
Grant AF-AFOSR-698-67
See also AD-767 640.
Availability: Pub. in Scripta Mathematica, v29 n1-2 p111-114 n.d.

Descriptors: (*Matrix algebra, *Inequalities), Determinants, Theorems.

The paper gives an alternate proof for the singular values inequalities established in the preceding paper in this series. (Author)

AD-768 511/8GA Reprint
Ohio State Univ Columbus Div of Statistics
SEQUENTIAL ESTIMATION OF THE SCALE PARAMETER OF THE PARETO DISTRIBUTION.
Y. H. Wang. Jan 73, 11p AFOSR-TR-73-1813
Grant AF-AFOSR-1305-67
Revision of report dated Dec 72.
Availability: Pub. in Communications in Statistics, v2 n2 p145-154 1973.

Descriptors: (*Sampling, Sequential analysis), Probability density functions, Random variables, Tables.
Identifiers: *Sequantial sampling, Pareto density functions, Stopping times(Mathematics), Parameter estimation.

A sequential sampling procedure is developed to estimate the scale parameter theta of the Pareto distribution when the shape parameter sigma is unknown using the cost function C = A/log theta - log/+ n, where A is a positive constant. The probability distribution of the stopping time for this procedure is tabulated and the expected stopping time and cost under the sequential sampling procedure are computed and compared with the optimum sample size and minimum cost under the fixed sample size procedure (for the case when the shape parameter is known.) (Author)

AD-768 533/2GA Reprint
Princeton Univ N J
AN EXPONENTIAL MODEL FOR THE SPECTRUM OF A SCALAR TIME SERIES,
P. Bloomfield. Dec 72, 11p
Sponsored in part by Office of Naval Research, Arlington, Va. Revision of report dated May 72.
Availability: Pub. in Biometrika, v60 n2 p217-226 1973.

Descriptors: (*Time series analysis, Approximation(Mathematics)), Analysis of variance, Fourier analysis, Series, Mathematical models.
Identifiers: Parameter estimation, Nonparametric statistics, Maximum likelihood estimation.

Existing procedures for obtaining linear prediction formulae for time series may be placed in two categories. The first consists of methods which involve fitting parametric models of the autoregressive or autoregressive moving average type. The second involves the factorization of an estimated spectral density function; this is essentially a nonparametric procedure. The procedure suggested in this paper contains elements of both of the above. Formally, it involves fitting a model with a finite number of parameters. However, the model is formulated explicitly in terms of the spectral density function, and may also be viewed as a spectrum factorization method. The model has been fitted to various series considered by other authors, and the quality of the fit is compared with that obtained with conventional models using the same number of parameters. Asymptotic properties of the parameter estimates have been used to assess the nonparametric spectrum factorization techniques proposed by other authors.

AD-768 545/6GA Reprint
Massachusetts Univ Amherst Dept of Electrical and Computer Engineering
A SQUARE ROOT FORMULATION FOR THE COMBINED STATE-PARAMETER ESTIMATOR,
Michel R. Froidevaux, and Charles E. Hutchinson. 1973, 10p AFOSR-TR-73-1804
Grant AF-AFOSR-2443-73
Availability: Pub. in Proceedings of Symposium on Parameter Estimation Techniques and Applications in Aircraft Flight Testing, Edwards Air Force Base, Calif. 24-25 Apr 73, p1-8.

Descriptors: (*Control systems, Mathematical models), Linear systems, Matrix algebra, Partial differential equations, Statistical analysis, Algorithms, Flight testing.
Identifiers: Parameter estimation, Maximum likelihood estimation, Kalman filters, Control theory, Discrete time systems, Square roots.

A square root formulation is presented for the discrete combined state-parameter estimation problem with linear plant dynamics, Gaussian random disturbances and constant but uncertain parameters. The estimator is a combination of the classical Kalman filter and a maximum likelihood algorithm which maximizes the parameter log-likelihood function using a first-order search routine. (Author)

AD-768 556/3GA Reprint
Northwestern Univ Evanston Ill Dept of Electrical Engineering
GRAPHS WITH GIVEN CONNECTIVITY AND INDEPENDENCE NUMBER OR NETWORKS

WITH GIVEN MEASURES OF VULNERABILITY AND SURVIVABILITY,
A. T. Amin, and S. L. Hakimi. Apr 72, 12p
AFOSR-TR-73-1850
Grant AF-AFOSR-2103-71
Revision of report dated 22 Oct 71.
Availability: Pub. in IEEE Transactions on Circuit Theory, vCT20 n1 p2-10 Jan 73.

Descriptors: (*Graphics, Theorems), Networks, Set theory, Vulnerability, Algorithms, Mathematical models.
Identifiers: Graph theory, Connectivity(Graphics), Network flows.

The criterion for invulnerability of a network based on the connectivity of a graph is well treated in literature. The authors define a criterion for survivability of a network in terms of the independence number of a graph. The following problems are then considered. (1) Find an r-connected graph, with n vertices and (m sub 0) = ((nr + 1)/2) edges, whose independence number is the minimum possible, where (x) denotes the greatest integer less than or equal to x. (2) Given positive integers n, m, r, and k, find the realizability conditions for a graph with n vertices and m edges, whose connectivity is at least r and independence number is at most k. (Author)

AD-768 561/3GA Reprint
Florida State Univ Tallahassee Dept of Statistics
CONTRIBUTIONS TO THE THEORY OF DIRICHLET PROCESSES.
Interim rept.,
Ramesh M. Korwar, and Myles Hollander. 13 Oct 72, 9p AFOSR-TR-73-1909
Grant AF-AFOSR-2058-71
Availability: Pub. in the Annals of Probability, v1 n4 p705-711 1973.

Descriptors: (*Statistical processes, Sampling), Distribution functions, Measure theory, Random variables, Theorems.
Identifiers: *Dirichlet processes.

AD-768 568/8GA Reprint
Stanford Univ Calif Dept of Mathematics
THE POISSON PROCESS AS RENEWAL PROCESS,
K. L. Chung. 12 Oct 70, 12p AFOSR-TR-73-1792
Contract F44620-67-C-0049
Availability: Pub. in Periodica Mathematica Hungarica, v2 p41-48 1972.

Descriptors: (*Stochastic processes, Theorems), Random variables, Distribution functions.
Identifiers: Order statistics, *Renewal processes, *Poisson processes.

Various new characterizations of the Poisson process among all renewal processes are given. These involve the spent life, residual life, and gap lengths between jumps. Processes whose gap distributed are exponential up to a given time are introduced. (Author)

AD-768 569/6GA Reprint
Stanford Univ Calif Dept of Mathematics
ON THE SPECTRUM OF A CLASS OF MATRICES ARISING IN STORAGE THEORY,
P. J. Brockwell. 2 Nov 72, 11p AFOSR-TR-73-1791
Contract F44620-67-C-0049
Prepared in cooperation with Michigan State Univ., East Lansing. Dept. of Statistics. Revision of report dated 7 Mar 72.
Availability: Pub. in Z. Wahrscheinlichkeitstheorie verw. Geb., v25 p253-260 1973.

Descriptors: (*Stochastic processes, Matrix algebra), Distribution functions, Storage, Mathematical models.
Identifiers: Markov chains, Spectrum analysis.

A continuous time Markov chain arising from storage models such as dams is studied. Spectrum analysis is used to describe the limiting distribution of the process (X(t), mu(t)) where X(t) is the content and mu(t) is the rate of change at time t. (Author)

AD-768 570/4GA Reprint
Stanford Univ Calif Dept of Mathematics
ON THE CONSTRUCTION OF CERTAIN TRANSITION FUNCTIONS,
Charles W. Lamb. 1 Oct 70, 15p AFOSR-TR-73-1812
Contract F44620-67-C-0049
Revision of report dated 23 Mar 70.
Availability: Pub. in The Annals of Mathematical Statistics, v42 n2 p439-450 1971.

Descriptors: (*Stochastic processes, Matrix algebra), Random variables, Theorems.
Identifiers: *Markov chains.

A probabilistic method is given for constructing certain transition functions arising in the boundary theory of Markov chains considered by Chung. A conjecture by Reuter is proved. (Author)

AD-768 643/9GA Reprint
Wisconsin Univ Madison
PAIRS OF POSITIVE SOLUTIONS OF NONLINEAR ELLIPTIC PARTIAL DIFFERENTIAL EQUATIONS,
Paul H. Rabinowitz. 29 Dec 72, 15p
Contract N00014-67-A-0128-0024
Prepared in cooperation with Aarhus Univ. (Denmark).
Availability: Pub. in Indiana Univ. Mathematics Jnl., v23 n2 p173-186 1973.

Descriptors: (*Partial differential equations, Theorems), (*Nonlinear differential equations, Integration), Topology, Set theory.
Identifiers: *Elliptic differential equations, Existence theorems, Uniqueness theorems.

The existence of positive solutions of nonlinear elliptic partial differential equations has been the object of a great deal of study. In the paper the author treat a family of nonlinear elliptic eigenvalue problems for which positive solutions occur in pairs.

AD-768 676/9GA Reprint
Princeton Univ N J
THE 1972 WALD LECTURE. ROBUST STATISTICS: A REVIEW,
Peter J. Huber. 22 Nov 71, 27p
Contract N00014-67-A-0151-0017
Revision of report dated 13 Oct 71. Prepared in cooperation with Eidgenoessische Technische Hochschule, Zurich (Switzerland). Presented at the IMS Annual Meeting at Hanover, N.H. 28 Aug-1 Sep 72.
Availability: Pub. in The Annals of Mathematical Statistics, v43 n4 p1041-1067 1972.

Descriptors: (*Statistical analysis, Reviews), Statistical tests, Statistical distributions, Stochastic processes, Minimax technique.
Identifiers: *Robust procedures, Statistical inference, Normal density functions, Maximum likelihood estimation.

The paper is a selective review on robust statistics, centering on estimates of location, but extending into other estimation and testing problems. After some historical remarks, several possible concepts of robustiness are critically reviewed. Three important classes of estimates are singled out and some basic heuristic tools for assessing properties of robust estimates (or test statistics) are discussed: influence curve, jackknifing. The author gives some asymptotic and finite sample minimax results for estimation and testing. The material is complemented by miscellaneous remarks on: computational aspects; other estimates; estimation problems; and tentative practical recommendations. (Author)

AD-768 718/9GA PC$16.75/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
NEARLY BEST CONDITIONAL LINEAR UNBIASED ESTIMATION OF THE MEAN AND STANDARD DEVIATION OF THE LOGISTIC DISTRIBUTION.
Master's thesis,
Stephen A. Hunter. Dec 69, 293p Rept no. GRE/MATH/69-3

Descriptors: (*Sampling, *Statistical distributions), Analysis of variance, Approximation(Mathematics), Probability density functions, Matrix algebra, Tables, Theses.
Identifiers: Parameter estimation, *Lagrange multipliers, *Order statistics, *Logistics density functions, Standard deviation, Mean.

The method of Lagrangian multipliers is used to find nearly best, minimum-variance, linear, unbiased, conditional estimator coefficients for the mean and standard deviation of the logistic distribution using M-order statistics. Coefficients for conditional parameter estimation are developed for full and censored samples of size N = 2(1)40. The equations for the estimators are derived in detail. Two types of censoring are used; single censoring from above and symmetrical censoring from each end. The results are presented in tables of coefficients for conditional estimation of the unknown parameter. It is shown how the tabled coefficients can be used for simultaneous estimation. (Author)

AD-768 879/9GA PC$2.75/MF$1.45
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
GERSCHGORIN THEORY FOR THE GENERALIZED EIGENVALUE PROBLEM AX = LAMBDA BX,
G. W. Stewart. Oct 73, 17p
Contract N00014-67-A-0314-0018

Descriptors: (*Matrix algebra, Theorems), Perturbation theory, Transformations(Mathematics), Numerical analysis, Theorems.
Identifiers: Gerschgorin circle theorem, Eigenvalues.

A generalization of Gerschgorin's theorem is developed for the eigenvalue problem Ax = lambda Bx and is applied to obtain perturbation bounds for multiple eigenvalues. The results are interpreted in terms of the chordal metric on the Riemann sphere, which is especially convenient for treating infinite eigenvalues. (Author)

AD-768 880/7GA PC$3.50/MF$1.45
Yale Univ New Haven Conn Becton Center
ADAPTIVE CONTROL AND IDENTIFICATION OF MULTIVARIABLE SYSTEMS USING LYAPUNOV'S DIRECT METHOD.
Technical rept.,
Kumpati S. Marendra, and Prabhakar Kudva. Jun 73, 51p Rept no. CT-56
Contract N00014-67-A-0097-0020
Report on Control Theory.

Descriptors: (*Adaptive control systems, Mathematical models), Nonlinear systems, Stability, Nonlinear differential equations, Matrix algebra, Identification systems.
Identifiers: *Control theory, Automatic control, Time varying systems, Time invariant systems, Lyapunov functions, Computerized simulation.

The design of stable model reference adaptive systems using the direct method of Lyapunov is considered in the report and many of the results obtained in recent years are presented in a unified manner. These results together with the recent work on adaptive observers make the entire approach a viable one for the identification and control of multivariable systems. In particular, they have proved effective in the control of VTOL aircraft systems and appear to be very attractive for many applications in process control. The results

are first obtained assuming that the systems are time-invariant but they carry over relatively easily to the slowly time-varying case.

AD-768 892/2GA PC$2.75/MF$1.45
Washington Univ Seattle
VENN DIAGRAMS AND INDEPENDENT FAMILIES OF SETS.
Technical rept.,
Branko Grunbaum. Sep 73, 25p Rept no. TR-45
Contract N00014-67-A-0103-0003

Descriptors: (*Convex sets, Graphics), (*Geometry, *Combinatorial analysis), Mathematical logic, Theorems.
Identifiers: *Venn diagrams, *Combinatorial geometry.

Motivated by the well known notions from probability and logic, the author says that a family of n simple closed curves (A sub 1),...,(A sub n) in the Euclidean plane is independent provided the intersection (*) (X sub 1)(X sub 2)...(X sub n) is nonempty whenever each set (X sub j) is either the interior or else the exterior of (A sub j). An independent family is a Venn diagram if each intersection (*) is connected. These notions are examined from the point of view of combinatorial geometry and several results are obtained; some of them correct erroneous assertion found in the literature. (Modified author abstract)

AD-768 893/0GA PC$3.00/MF$1.45
Washington Univ Seattle
NEW VIEWS ON SOME OLD QUESTIONS OF COMBINATORIAL GEOMETRY.
Technical rept.,
Branko Grunbaum. Sep 73, 33p* Rept no. TR-46
Contract N00014-67-A-0103-0003

Descriptors: (*Geometry, *Combinatorial analysis), Graphics, Convex sets, Triangulation, Inequalities, Theorems, Reviews.
Identifiers: *Convex polytypes, *Combinatorial geometry, *Graph theory, Brunel theorem, Sylvester theorem, De Rocquigny theorem, Venn diagrams, Wernicke theorem, Kotzig theorem, Erdos theorem.

Several rather old problems in combinatorial geometry have recently been solved, mostly within the frameworks of either the theory of convex polytopes, or that of arrangements of lines or curves. Among those surveyed: Solution of Brunel's (1897) problem about the number of hexagons in 3-valent planar maps with precisely 3 digons; substantial results on Sylvester's (1867) problem about the number of collinear triplets possible with n points; solution and extension of de Rocquigny's (1897) problem about the number of points of tangency in systems of mutually non-overlappins circles; corrections and generalizations of previously published assertions about Venn diagrams (1880). Among the new results established are: Sharpenings of Wernicke's (1904) and Kotzig's (1955) results about edges with endpoints of low valence in 3-dimensional convex polyhedra, and substantial improvements of previously known results on a problem of Drdos (1962) on collinear multiplets of points. (Modified author abstract)

AD-768 991/2GA PC$2.75/MF$1.45
Yale Univ New Haven Conn Becton Center
A NEW CANONICAL FORM FOR AN ADAPTIVE OBSERVER.
Technical rept.,
Gerd Lueders, and Kumpati S. Narendra. Jun 73, 11p Rept no. CT-57
Contract N00014-67-A-0097-0020
Report on Control Theory.

Descriptors: (*Adaptive control systems, Mathematical models), Linear systems, Differential equations, Matrix algebra, Identification systems. Identifiers: Cononical forms, Time invariant systems, *Control theory, Automatic control, Lyapunov functions.

A new canonical form for an adaptive observer is presented which estimates the state and identifies the parameters of an unknown nth order linear time-invariant system. This is the simplest adaptive observer presented so far in the literature. The adaptive scheme is shown to be globally asymptotically stable, thus guaranteeing the convergence of the identification process. (Author)

AD-768 992/0GA PC$2.75/MF$1.45
Yale Univ New Haven Conn Becton Center
AN IDENTIFICATION PROCEDURE FOR DISCRETE MULTIVARIABLE SYSTEMS.
Technical rept.,
Prabhakar Kudva, and Kumpati S. Narendra. Sep 73, 11p Rept no. CT-59
Contract N00014-67-A-0097-0020
Report on Control Theory.

Descriptors: (*Adaptive control systems, Mathematical models), Linear systems, Nonlinear systems, Difference equations, Matrix algebra, Identification systems, Graphics, Simulation.
Identifiers: *Control theory, Automatic control, Discrete time systems, Time invariant systems, Computerized simulation, Quadratic forms.

The report describes a procedure for adjusting the parameters of a model for the identification of linear and nonlinear discrete multivariable syatems when all the state variables are accessible and no observation noise is present. The scheme is shown to be stable when using Lyapunov's direct method.

AD-768 998/7GA PC$2.75/MF$1.45
George Washington Univ Washington D C Dept of Statistics
ON THE DESIGN OF EXPERIMENTS FOR TESTING THE SIMULTANEOUS EFFECTS OF A TREATMENT AGAINST A CONTROL AT DIFFERENT LOCATIONS.
Technical rept.,
S. Zacks, and H. Solomon. 28 Sep 73, 17p Rept no. TR-11
Contract N00014-67-A-0214-0015

Descriptors: (*Experimental design, *Statistical tests), Sampling, Probability density functions, Random variables, Distribution theory.
Identifiers: Bayesian analysis, Hypotheses, Allocation models, Chi square test.

Testing the simultaneous effects of a treatment against a control when an experiment is conducted at each of several locations is studied in connection with design problems and sample allocation over the locations. This arises in clinical trials situations and other sampling settings. While the observations are binomial, the typical sample sizes are large enough to permit variance stabilizing transformations and the normal model. A balanced allocation arises under the criterion of minimal volumes for simultaneous confidence ellipsoids. This is analogous to testing the hypothesis of all differences equal to zero against the composite hypothesis that the differences between the experimental variable and the control variable are unequal. This balanced allocation is minimax under some general conditions but not necessarily Bayes. The composite hypothesis that all differences are equal to some value (not zero) is tested against the alternative that they are not equal. For the case of two locations, the balanced allocation is optimal; for a large number of locations, the problem is still open. (Author)

AD-769 008/4GA Reprint
Colorado Univ Boulder
APPLICATIONS OF FEFFERMAN-STEIN TYPE INTERPOLATION TO PROBABILITY THEORY AND ANALYSIS,
Daniel W. Stroock. Jan 73, 19p
Grant AF-AFOSR-2307-72
Availability: Pub. in Communication on Pure and Applied Mathematics, v26 p477-495 1973.

Descriptors: (*Probability, Interpolation), Measure theory, Banach space, Hilbert space, Inequalities, Theorems.
Identifiers: Fefferman-Stein interpolation.

The purpose of the paper is to put some of the recent results of Fefferman and Stein in a probabilistic setting.

AD-769 009/2GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
A LIMIT THEOREM WITH STRONG MIXING IN BANACH SPACE AND TWO APPLICATIONS TO STOCHASTIC DIFFERENTIAL EQUATIONS,
G. C. Papanicolaou, and S. R. S. Varadhan. Feb 73, 28p
Grants AF-AFOSR-2307-72, NSF-GP-32996
Availability: Pub. in Communications on Pure and Applied Mathematics, v26 p497-524 1973.

Descriptors: (*Differential equations, Functional analysis), Banach space, Nonlinear differential equations, Stochastic processes, Measure theory, Theorems.
Identifiers: Stochastic differential equations, Limit theorems.

In a previous paper the asymptotic behavior of the expected value of the solution of an abstract stochastic equation was investigated. The results obtained in the previous paper were limited by severe restrictions on the allowed form of the stochastic perturbation. Recently, Cogburn and Hersh have generalized the results considerably by allowing a much broader class of stochastic perturbations and requiring only a strong mixing condition. The aim here is to improve the results of Cogburn and Hersh by giving an estimate for the error committed in the asymptotic approximation.

AD-769 016/7GA Reprint
Missouri Univ Columbia Dept of Statistics
A THEOREM ABOUT THE OSCILLATION OF SUMS OF INDEPENDENT RANDOM VARIABLES.
Interim rept.,
D. L. Hanson, and F. T. Wright. 7 Jan 72, 11p
AFOSR-TR-73-1950
Grant AF-AFOSR-2031-71
Revision of report dated 29 Sep 71.
Availability: Pub. in the Proceedings of the American Mathematical Society, v37 n1 p226-233 Jan 73.

Descriptors: (*Power series, Convergence), Random variables, Oscillation, Theorems.
Identifiers: Monotone functions.

Let (X sub n) be a sequence of independent and identically distributed random variables and let (S sub n) = (X sub 1)+...+(X sub n). The relationship between the t-th moment of (X sub 1) and the convergence of the series. The summation from n=1 to infinity of (z sup n)(n sup (t-1))P(S sub n)>0 is investigated in this paper. The convergence of this series when /z/ = 1 but z not = 1 is related to the oscillation of the sequence (P(S sub n)>0) and to the oscillation of the sequence (S sub n) about zero. (Author)

AD-769 023/3GA Reprint
Missouri Univ Columbia Dept of Statistics
ON CONSISTENCY IN MONOTONIC REGRESSION.
Interim rept.,
D. L. Hanson, Gordon Pledger, and F. T. Wright.
8 Jun 72, 24p AFOSR-TR-73-1951
Grant AF-AFOSR-2031-71
Revision of report dated 8 Nov 71.
Availability: Pub. in the Annals of Statistics, v1 n3 p401-421 1973.

Descriptors: (*Regression analysis, Distribution functions), Random variables, Set theory, Theorems.
Identifiers: Monotone functions, Maximum likelihood estimation.

AD-769 034/0GA Reprint
Purdue Univ Lafayette Ind
ON THE ORDER STATISTICS FROM EQUALLY CORRELATED NORMAL RANDOM VARIABLES,
Shanti S. Gupta, Klaus Nagel, and S. Panchapakesan. Dec 72, 11p
Prepared in cooperation with Siemens, West Germany and Southern Illinois Univ. Sponsored in part by Office of Naval Research. Revision of report dated Aug 72.
Availability: Pub. in Biometrika, v60 n2 p403-413 1973.

Descriptors: (*Statistical analysis, Random variables), Correlation techniques, Distribution theory, Matrix algebra, Tables.
Identifiers: *Order statistics, Normal density functions.

Let X1,..., XN be N standardized normal variables with correlation matrix rho(ij) and let X(1) = or < ... = or < X(N) denote the ordered Xi. Besides some general distribution theory this paper deals with the case where rho(ij) = rho(p > 0) for all i and j (i not equal to j). (Modified author abstract)

AECL-4210/GA PC$6.25/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
REMES 2: A FORTRAN PROGRAM TO CALCULATE RATIONAL MINIMAX APPROXIMATIONS TO A GIVEN FUNCTION.
J. H. Johnson, and J. M. Blair. May 73, 85p
U.S. Sales Only.

Descriptors: (*Functions, *Errors), (*Computer codes, *R codes), Algorithms, Fortran.

For abstract, see NSA 28 08, number 20562.

AERE-TP-430/GA PC$4.00/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
RECENT ADVANCES IN UNCONSTRAINED OPTIMIZATION.
M. J. D. Powell. Nov 70, 39p
U.S. Sales Only.

Descriptors: (*Algorithms, *Accuracy), (*Mathematics, *Optimization), Functions, Metrics, Reviews.

For abstract, see NSA 28 08, number 20566.

CEA-N-1569/GA PC$3.50/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
GENERATION OF A POISSON DISTRIBUTION. APPLICATION TO THE SIMULATION OF MEASUREMENTS OF DECAYING ACTIVITY OF RADIOISOTOPES.
A. Becker, J. Lame, and M. Vallee. Feb 73, 30p
In French. U.S. Sales Only.

Descriptors: (*Distribution functions, *Counting techniques), (*Radioactivity, Counting techniques), Half-life, Programming, Statistics.

For abstract, see NSA 28 08, number 20134.

CONF-730812-2/GA PC$3.00/MF$1.45
Minnesota Univ., Minneapolis. Oak Ridge National Lab., Tenn.
SPARSE AND CROWDED CELLS AND DIRICHLET DISTRIBUTIONS.
M. Sobel, and V. R. R. Uppuluri. 1972, 10p

Descriptors: (*Mathematics, *Dirichlet problem).

For abstract, see NSA 28 07, number 17698.

COO-1469-212/GA PC$8.75/MF$1.45
Illinois Univ., Urbana. Dept. Of Computer Science.
AUTOMATIC SOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS.
L. A. Larsen. Oct 72, 134p UIUCDCS-R-72-546
Contract AT(11-1)-1469

Descriptors: (*Differential equations, *Numerical solution), Automation, Computer codes.

For abstract, see NSA 28 08, number 20569.

COO-1469-215/GA PC$4.50/MF$1.45
Illinois Univ., Urbana. Dept. Of Computer Science.
NUMERICAL SYSTEMS ON A MINICOMPUTER.
R. L. Jr. Brown. Feb 73, 47p UIUCDCS-R-73-555
Contract AT(11-1)-1469

Descriptors: (*Computers, *Programming), (*Differential equations, *Numerical solution), Fortran, Pdp computers.

For abstract, see NSA 28 08, number 20570.

ITEF-934/GA PC$3.25/MF$1.45
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Moscow. Institut Teoreticheskoi I Eksperimental'Noi Fiziki.
STUDY OF SOME QUESTIONS OF THE SYNTHESIS OF THRESHOLD FUNCTIONS.
V. I. Belyakov-Bodin, and S. I. Rozenblit. 1972, 21p
In Russian. U.S. Sales Only.

Descriptors: Algorithms, Functions, Logic circuits.

For abstract, see NSA 28 08, number 20571.

ITEF-946/GA PC$3.00/MF$1.45
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Moscow. Institut Teoreticheskoi I Eksperimental'Noi Fiziki.
EVALUATIONS OF APPROXIMATE SOLUTIONS OF INTEGRAL FREDHOLM EQUATIONS OBTAINED BY THE METHOD OF ACCELERATED CONVERGENCE AND BY THE METHOD OF AVERAGING FUNCTIONAL CORRECTIONS.
E. A. Grebenikov, and A. A. Morozova. 1972, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Fredholm equation, *Analytical solution), Banach space, Distance.

For abstract, see NSA 28 08, number 20572.

LA-UR-73-918/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
COMPARATIVE EFFICIENCY OF CERTAIN FINITE ELEMENT AND FINITE DIFFERENCE METHODS FOR A HYPERBOLIC PROBLEM.
B. Swartz, and B. Wendroff. 1973, 13p CONF-730713-1
Contract W-7405-eng-36

Descriptors: (*Differential equations, *Numerical solution), Efficiency, Errors, Finite difference method, Finite element method, Pade approximation.

For abstract, see NSA 28 08, number 20577.

LBL-2033/GA PC$4.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
NUMERICAL STUDY OF THE DISCRETE MINIMAL SURFACE EQUATION IN A NON-CONVEX DOMAIN.
P. Concus. Jun 73, 15p
Contract W-7405-eng-48

Descriptors: (*Differential equations, *Numerical solution), Dirichlet problem, Surfaces.

For abstract, see NSA 28 08, number 20578.

N73-30207/7GA PC$9.75/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Electronic Systems Lab.
ON THE DECENTRALIZED CONTROL OF LARGE-SCALE SYSTEMS.
Ph.D. Thesis.
C. Chong. Jun 73, 155p NASA-CR-133857, ESL-R-503
Contracts NGL-22-009-124, AF-AFOSR-2273-72

Descriptors: *Control theory, *Stochastic processes, Hierarchies, On-line programming, Problem solving, Real time operation.

For abstract, see STAR 1121

N73-30563/3GA PC$11.00/MF$1.45
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Engineering Science and Mechanics.
ON DIGITAL SIMULATION OF MULTICORRELATED RANDOM PROCESSES AND ITS APPLICATIONS.
Ph.D. Thesis.
A. K. Sinha. Jul 73, 178p NASA-CR-62092
Contract NGL-47-004-067

Descriptors: *Digital simulation, *Fourier transformation, *Random processes, *Trigonometric functions, Normal density functions, Spectral correlation, Time series analysis.

For abstract, see STAR 1121

N73-30567/4GA PC$6.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS BY THE TAYLOR SERIES METHOD.
A. Silver, and E. Sullivan. Jul 73, 76p NASA-TM-X-70438, X-641-73-202

Descriptors: *Computer programming, *Differential equations, *Taylor series, Algorithms, Fortran, Numerical integration, Pl/1.

For abstract, see STAR 1121

N73-30995/7GA PC$4.50/MF$1.45
Behavioral Technology Consultants, Silver Spring, Md.
STATISTICAL EVALUATION OF TIME SERIES ANALYSIS TECHNIQUES.
V. A. Benignus. Jun 73, 47p NASA-CR-134011
Contract NAS9-12902

Descriptors: *Computer programs, *Multivariate statistical analysis, *Spectrum analysis, Fast fourier transformations, Monte carlo method, Nasa programs, Performance.

For abstract, see STAR 1122

N73-31131/8GA PC$3.25/MF$1.45
Rice Univ., Houston, Tex. Inst. for Computer Services and Applications.
DATA SMOOTHING AND ERROR DETECTION BASED ON LINEAR INTERPOLATION.
V. M. Guerra, and R. A. Tapia. Sep 72, 25p NASA-CR-133984, ICSA-275-025-006
Contract NAS9-12776

Descriptors: *Data smoothing, *Error detection codes, *Interpolation, Algorithms, Convergence, Error correcting devices, Iteration.

For abstract, see STAR 1122

N73-31204/3GA PC$3.75/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany). Inst. fuer Dynamik der Flugsysteme.
STABILITY OF DOUBLE-LOOP SYSTEMS WITH DEAD TIME STABILITAET ZWEIKREISIGER TOTZEITSYSTEME.
R. Luetzendorf. 12 Jul 72, 31p DLR-FB-72-45
In German; English Summary.

Descriptors: *Control stability, *Feedback circuits, *Feedback control, Laplace transformation, Loops, Relaxation time, Stability tests, Transfer functions.

For abstract, see STAR 1122

N73-31373/6GA PC$3.00/MF$1.45
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
ON THE NUMERICAL DETERMINATION OF PARTICLE SIZE DISTRIBUTION IN A COAGULATING AEROSOL.
D. H. Ferriss. May 73, 17p NPL-NAC-35

Descriptors: *Aerosols, *Coagulation, *Computer programs, *Particle size distribution, Differential equations, Mathematical models, Nonlinear equations, Numerical integration.

For abstract, see STAR 1122

N73-31550/9GA PC$6.00/MF$1.45
Rice Univ., Houston, Tex. Inst. for Computer Services and Applications.
THE USE OF THE MODIFIED CHOLESKY DECOMPOSITION IN DIVERGENCE AND CLASSIFICATION CALCULATIONS.
D. L. Vanrooy, M. S. Lynn, and C. H. Snyder. May 73, 80p NASA-CR-133990, ICSA-275-025-008
Contract NAS9-12776

Descriptors: *Algorithms, *Computer programs, *Remote sensors, Flow charts, Fortran, Numerical analysis, Statistical analysis.

For abstract, see STAR 1122

N73-31551/7GA PC$3.50/MF$1.45
Rice Univ., Houston, Tex. Inst. for Computer Services and Applications.
SPLINE SMOOTHING OF HISTOGRAMS BY LINEAR PROGRAMMING.
J. O. Bennett. Sep 72, 30p NASA-CR-133987, ICSA-275-025-002
Contract NAS9-12776

Descriptors: *Histograms, *Linear programming, *Spline functions, Approximation, Euclidean geometry, Frequency distribution.

For abstract, see STAR 1122

N73-31552/5GA PC$3.00/MF$1.45
Rice Univ., Houston, Tex. Inst. for Computer Services and Applications.
POWER SPECTRAL DENSITY ESTIMATION BY SPLINE SMOOTHING IN THE FREQUENCY DOMAIN.
R. J. P. Defigueiredo, and J. R. Thompson. Sep 72, 13p NASA-CR-133986, ICSA-275-025-004
Contract NAS9-12776

Descriptors: *Power spectra, *Spline functions, *Stochastic processes, Computerized simulation, Digital computers, Ergodic process, Fourier transformation.

For abstract, see STAR 1122

N73-31553/3GA PC$3.00/MF$1.45
Rice Univ., Houston, Tex. Inst. for Computer Services and Applications.
A RANDOM NUMBER GENERATOR FOR CONTINUOUS RANDOM VARIABLES.
V. M. Guerra, R. A. Tapia, and J. R. Thompson. Sep 72, 11p NASA-CR-133983, ICSA-275-025-007
Contract NAS9-12776

Descriptors: *Fortran, *Random variables, Input/output routines, Statistical analysis, Subroutines, Tables (Data).

For abstract, see STAR 1122

N73-31554/1GA PC$3.00/MF$1.45
Rice Univ., Houston, Tex. Inst. for Computer Services and Applications.
A GEOMETRICAL INTERPRETATION OF THE 2N-TH CENTRAL DIFFERENCE.
R. A. Tapia. Sep 72, 5p NASA-CR-133985, ICSA-275-025-005
Contract NAS9-12776

Descriptors: *Differences, *Geometry, *Recursive functions, Algorithms, Canonical forms, Mathematical models, Theorem proving.

For abstract, see STAR 1122

N73-31559/0GA PC$3.25/MF$1.45
California State Coll., Fullerton. Dept. of Mathematics.
ANALYSIS AND OPTIMIZATION OF CYCLIC METHODS IN ORBIT COMPUTATION.
S. Pierce. Feb 73, 24p NASA-CR-132806, TR-05-071-005-1
Contract NGR-05-071-005

Descriptors: *Differential equations, *Optimization, *Orbit calculation, Errors, Numerical integration, Problem solving.

For abstract, see STAR 1122

N73-31560/8GA PC$4.00/MF$1.45
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
QUASI-NEWTON METHODS FOR LINEARLY CONSTRAINED OPTIMIZATION.
P. E. Gill, and W. Murray. May 73, 38p NPL-NAC-32

Descriptors: *Algol, *Algorithms, *Approximation, *Newton-raphson method, *Optimization, Iteration, Matrices (Mathematics), Steepest descent method.

For abstract, see STAR 1122

N73-31725/7GA PC$6.00/MF$1.45
Modern Systems Analysis, Inc., Ann Arbor, Mich.
NUMERICAL INTEGRATION ROUTINES FOR NEAR-EARTH OPERATIONS.
Final Report.
W. F. Powers. Sep 73, 79p NASA-CR-134021, REPT-9-12319-73F
Contract NAS9-12319

Descriptors: *Analysis (Mathematics), *Numerical integration, *Subroutines, Computer systems programs, Measure and integration, Real variables, Runge-kutta method.

For abstract, see STAR 1122

N73-31758/8GA PC$9.00/MF$1.45
Technische Hochschule, Munich (West Germany). Inst. fuer Astronomische und Physikalische Geodaesie.
DETERMINATION OF PROBLEMS OF MOTION BY TEMPORAL BOUNDARY VALUES DETERMINIERUNG VON BEWEGUNGSPROBLEMEN DURCH ZEITLICHE RANDWERTE.
M. Schneider. May 72, 139p BMBW-FB-W-72-17, MITT-82
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
In German; English Summary.

Descriptors: *Boundary value problems, *Eigenvectors, *Green function, *Orbital mechanics, Applications of mathematics, Differential equations, Field theory (Physics), Operators (Mathematics), Series (Mathematics).

For abstract, see STAR 1122

PB-224 410/1GA PC$5.75/MF$1.45
Environmental Protection Agency, Cincinnati, Ohio. Office of Water Program Operations.
AN INTRODUCTION TO MATH LOGIC.
Final rept.,
Joseph F. Santner. Sep 73, 73p EPA-430/1-73-012

Descriptors: (*Mathematical logic, Manuals), Theorems, Hypotheses.

The report is intended for scientists who are concerned with understanding the program of action followed proving conditional and biconditional theorems. The conditional and biconditional theorem can be stated in many ways and the equivalence of these various forms is clearly pointed out. Practice problems with answers are provided at the end of the three Chapters.

PB-224 495/2GA PC$3.00/MF$1.45
Environmental Protection Agency, Cincinnati, Ohio. Office of Water Program Operations.
INTRODUCTION TO TESTS OF SIGNIFICANCE.
Training Manual,
Sep 73, 19p EPA-430/1-73-010

Descriptors: (*Statistical tests, *Significance), Hypotheses, Statistical decision theory, Statistical distributions, Random variables, Manuals.

In the paper the author characterizes the program action necessary in a two-tailed test of significance by defining and relating the following: (1) test of significance, (2) statistic, (3) null hypothesis, (4) test assumptions, (5) law of random variation for the statistic when H sub O is true, (6) alternative hypothesis, (7) distribution of the statistic when H sub A is true, (8) four possible decisions in a test of significance, (9) type-I error, (10) critical values, or value, (11) type-II error, (12) power of the test, (13) rejection region, (14) acceptance region, (15) decision rules, (16) statistical decision, (17) diagram of a two-sided test of significance, (18) robustness, (19) sample size, (20) test of significance summarized, (21) example of a two-tailed t-test. The extension of a test significance to a one-sided test are covered in the sequel, 'Variations on a Test of Significance.' (Author)

PB-224 496/0GA PC$3.00/MF$1.45
Environmental Protection Agency, Cincinnati, Ohio. Office of Water Program Operations.
VARIATIONS ON A TEST OF SIGNIFICANCE.
Training manual,
Joseph F. Santner. Sep 73, 11p EPA-430/1-73-011

Descriptors: (*Statistical tests, *Significance), Hypotheses, Statistical decision theory, Manuals.

The paper is a sequel to 'Introduction to Tests of Significance' where the concepts of the program of action in a test of significance were outlined by using a two-sided test as a model. The extension to a one-sided are covered in the paper as well as the justification necessary before such a test can be made. Two examples illustrate the application.

PB-224 498/6GA PC$3.00/MF$1.45
Environmental Protection Agency, Cincinnati, Ohio. Office of Water Program Operations.
A QUICK LOOK AT STATISTICS.
Training manual,
Joseph F. Santner. Mar 73, 18p EPA-430/1-73-004

Descriptors: (*Statistical analysis, Manuals), Applications of mathematics, Experimental design.

An introduction into the entire field of statistics is presented from three different viewpoints for those who have had no previous training. It is also intended for those with limited training so that their background can be correctly oriented in the entire field. A third use is for scientists to help identify what types of problems can be solved by using statistical techniques.

SLA-73-627/GA PC$3.75/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
COMPUTER PROGRAMS FOR CALCULATING CERTAIN FACTORS ASSOCIATED WITH NORMAL RANDOM VARIABLES.
D. E. Amos, and S. L. Daniel. Jun 73, 35p

Descriptors: (*Integral equations, *Computer calculations), (*Computer codes, Integral equations), Equations, G codes, O codes, T codes.

For abstract, see NSA 28 08, number 20585.

SLL-73-262/GA PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N. Mex. Sandia Labs., Livermore, Calif.
CDC 6600 CODES FOR THE BESSEL FUNCTIONS J SUB 0 (Z) AND J SUB 1 (Z) FOR ARBITRARY VALUES OF THE COMPLEX VARIABLE Z.
D. E. Amos, and R. E. Huddleston. Jul 73, 24p
Contract AT(29-1)-789

Descriptors: (*Bessel functions, Computer codes), (*Computer codes, *B codes), Cdc computers.

For abstract, see NSA 28 08, number 20589.

UCID-30050(Pt.4)/GA PC$6.25/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
CONSTRUCTION OF MATHEMATICAL SOFTWARE. PART VI. NONLINEAR LEAST SQUARES CODES.
B. Johnston. Jan 73, 81p
Contract W-7405-eng-48

Descriptors: Algorithms, Errors, Least square fit, Mathematics, Nonlinear problems.

For abstract, see NSA 28 08, number 20592.

12B. Operations Research

AD-768 796/5GA PC$2.75/MF$1.45
Florida Univ Gainesville Dept of Industrial and Systems Engineering
A MINIMAX LOCATION PROBLEM ON A NETWORK.
Research rept.,
Perino M. Dearing, and Richard L. Francis. Sep 73, 24p Rept no. RR-73-14 AROD-10841:2-RT
Grant DA-ARO-D-31-124-72-G123
Prepared in cooperation with Cornell Univ., Ithaca, N.Y. Dept. of Operations Research. Errata sheet inserted.

Descriptors: (*Minimax technique, Algorithms), Transportation, Networks, Mathematical models, Theorems, Optimization.
Identifiers: Transportation models, Location problems, Trees(Mathematics), *Network flows, Metric spaces.

The authors consider a network model of a system of transportation links, with nodes representing locations of existing facilities, and study the problem of finding a new facility location on the network which minimizes the maximum of linear increasing functions of the network distances between the new facility and the existing facilities. The problem is formulated with respect to a metric space which is defined on the network, and a number of properties of the problem are developed. The properties lead to a new, efficient algorithm for solving the problem when the network is a tree, and to a new, equivalent, spanning tree problem for a general network. (Author)

AD-768 876/5GA PC$3.00/MF$1.45
California Univ Los Angeles Western Management Science Inst
THE FACTORIZATION APPROACH TO LARGE-SCALE LINEAR PROGRAMMING,
G. W. Graves, and R. D. McBride. Aug 73, 34p
Rept no. WMSI-Working Paper-208
Contract N00014-69-A-0200-4042, Grant NSF-GP-36090

Descriptors: (*Linear programming, Algorithms), Matrix algebra, Networks, Simplex method.
Identifiers: Factorization, Duality theory, Constraints, Partitions(Mathematics).

A unifying concept for large-scale linear programming is developed. This approach called 'factorization' allows one to isolate the effect of different types of constraints and variables in the algebraic representation of the tableau. Two different factorizations based on a double representation of the basic tableau are presented. The use of factorization to obtain efficient algorithms for generalized upper bounding and block diagonal constraints as well as the general network problem is discussed. Computational results for a new network algorithm based on factorization are presented. (Author)

AD-768 877/3GA PC$3.50/MF$1.45
California Univ Los Angeles Western Management Science Inst
MULTICOMMODITY DISTRIBUTION SYSTEM DESIGN BY BENDERS DECOMPOSITION,
A. Geoffrion, and G. W. Graves. Aug 73, 55p Rept no. WMSI-Working Paper-209
Contract N00014-69-A-0200-4042, Grant NSF-GP-36090

Descriptors: (*Food dispensing, Distribution theory), (*Linear programming, Optimization), Multiple operation, Transportation, Mathematical models, Algorithms.
Identifiers: Integer programming.

A commonly occurring problem in distribution system design is the optimal location of intermediate distribution facilities between plants and customers. A multi-commodity capacitated single-period version of this problem is formulated as a mixed integer linear program. A solution technique based on Benders decomposition is developed, implemented, and successfully applied to a real problem for a major food firm with 17 commodity classes, 14 plants, 45 possible distribution center sites, and 121 customer zones. An essentially optimal solution was found and proven with a surprisingly small number of Benders cuts. Some discussion is given concerning why this problem class appears to be so amenable to solution by Benders' method, and also concerning what the authors feel to be the proper professional use of the present computational technique. (Author)

AERE-TP-431/GA PC$4.00/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
EFFICIENT, GLOBALLY CONVERGENT, ALGORITHM FOR UNCONSTRAINED AND LINEARLY CONSTRAINED OPTIMIZATION PROBLEMS.
R. Fletcher. Dec 70, 39p
U.S. Sales Only.

Descriptors: (*Algorithms, *Accuracy), (*Mathematics, Algorithms), Functions, Optimization.

For abstract, see NSA 28 08, number 20567.

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

ANL/ES-23/GA PC$4.00/MF$1.45
Argonne National Lab., Ill.
CHLORINATION EXPERIMENTS AT THE JOHN E. AMOS PLANT OF THE APPALACHIAN POWER COMPANY: APRIL 9--10, 1973.
J. E. Draley. Jun 73, 26p
Contract W-31-109-eng-38

Descriptors: (*Chlorine, *Chemical analysis), (*Water, Chemical analysis), (*Cooling towers, *Liquid wastes), Chlorination, Cooling, Power plants, Quantitative chemical analysis.

For abstract, see NSA 28 07, number 15501.

N73-30884/3GA PC$4.50/MF$1.45
Washington Univ., Seattle. Dept. of Mechanical Engineering.
CONSTRUCTION AND TESTING OF A GAS-LOADED, PASSIVE-CONTROL, VARIABLE-CONDUCTANCE HEAT PIPE.
Final Report.
C. A. Depew, W. J. Sauerbrey, and B. A. Benson. Apr 73, 49p NASA-CR-114597, M-4-26-73
NASA ORDER A-52728-A

Descriptors: *Heat pipes, *Methyl alcohols, *Nitrogen, *Temperature control, Bellows, Heat sinks, Liquids.

For abstract, see STAR 1121

N73-31829/7GA PC$6.25/MF$1.45
Hamilton Standard Div., United Aircraft Corp., Windsor Locks, Conn.
ICE PACK HEAT SINK SUBSYSTEM - PHASE 1, VOLUME 2.
G. J. Roebelen, Jr.. Jun 73, 84p NASA-CR-114624-VOL-2, SVHSER-6223-VOL-2
Contract NAS2-7011
Seri-2.

Descriptors: *Cooling systems, *Heat sinks, *Heat transfer, *Protective clothing, *Space suits, Human factors engineering, Product development, Systems analysis.

For abstract, see STAR 1122

PATENT-3 493 220/GA Not available NTIS
Department of the Navy Washington D C
FURNACE FOR TREATING MATERIAL IN A GAS ATMOSPHERE.
Patent,
William Anthony Kagdis, and John Julian Tanski, Sr. Filed 7 Mar 68, patented 3 Feb 70, 5p Rept nos. PAT-APPL-711 421,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Furnaces, Controlled atmospheres), (*Patents, Furnaces), Semiconductors, Disks, Diffusion, Gas flow.
Identifiers: PAT-CL-263-41.

The patent describes a furnace useful in treating semiconductor wafers by means of a gas atmosphere. The furnace is oriented vertically and comprises an outer chamber provided with gas inlet and gas outlet ports; means for creating turbulence in the admitted gas and means for imparting motion to the wafers to insure that the wafers are uniformly acted upon by the gas; means for

providing the wafers with an inert gas cover when no treatment is desired; and means for safely removing residual gas from the furnace.

PATENT-3 499 240/GA Not available NTIS
Department of the Navy Washington D C
ILLUMINATED GRID FOR BACKLIGHTED PLOTTING BOARDS.
Patent,
Simeon H. Cotton, Jr., and Bruno A. Cagna. Filed 21 Feb 67, patented 10 Mar 70, 3p Rept nos. PAT-APPL-618 297,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Display systems, *Patents), Lighting equipment, Panels(Structural), Laminates, Illumination.
Identifiers: PAT-CL-40-130.

The patent relates to a backlighted plotting board or other display covered with a translucent material having information inscribed thereon in paints which are sensitive to different frequencies of light. When the plotting board is backlighted with natural light the information thereon is visible through the translucent material and paints which are not sensitive to natural light. When the backlighting is removed and light of different frequency, for example in the ultra violet range of frequencies, is directed to the front of the display the information on the plotting board disappears and that on the translucent material becomes visible.

PB-224 304/6GA PC$5.25/MF$1.45
Texas Transportation Inst., College Station.
ROADWAY ILLUMINATION SYSTEMS.
Final rept. Sep 69-May 72,
Neilon J. Rowan, and Ned E. Walton. May 72, 194p* TTI-2-8-69-137-2F
Prepared in cooperation with Texas Highway Dept., Austin.

Descriptors: (*Highway lighting, *Cost effectiveness), Illuminance, Lighting equipment, Protective lighting, Mercury lamps, Poles(Supports), Hazards, Traffic safety, Photometry, Glare, Visual perception, Luminous intensity.

Discussions on test and evaluation of new lighting equipment and systems, high-mast lighting, transitional lighting, safety lighting, driver visual behavior, and lighting cost-effectiveness are given. Photometric data are given for newer light sources, as well as comparisons made with mercury vapor. A technique for extrapolation of photometric data is given which indicates close correlation with field measured data. High-mast lighting data and a design procedure is reported. A relative hazard index was developed for use of luminaire supports in medians. The effect of glare upon driver behavior is also included. The eye-mark camera was used to determine driver visual behavior. A cost-effectiveness technique is reported that can serve as a tool for the decision-making process.

SLA-73-207/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
HEAT TRANSMISSION BY HOT WATER THROUGH LONG PIPELINES.
S. Thunborg. Jun 73, 15p

Descriptors: (*Water, *Heat transfer), (*Energy transmission, Pipelines), (*Pipelines, *Efficiency), Comparative evaluations, Cost, Economics, Fluid flow, Heating, Numerical solution.

For abstract, see NSA 28 08, number 20543.

13B. Civil Engineering

AD-768 681/9GA PC$4.25/MF$1.45
Stevens Inst of Tech Hoboken N J Davidson Lab
MODEL STUDY OF THE DILUTION OF SOLUBLE LIQUIDS DISCHARGED FROM TANKERS.
Final rept.,
John A. Mercier, Richard I. Hires, and Meige Wu. Sep 73, 106p* USCG-D-12-74
Contract DOT-CG-33148-A

Descriptors: (*Water pollution, Tankers), (*Tankers, Cleaning), Model tests, Propellers(Marine), Fluid flow, Ship hulls.
Identifiers: Dilution, Effluents, *Water pollution control.

A program of model experimental research was undertaken to study the dispersion of effluent discharged from chemical tankers. The effects of discharge location, volume rate and velocity of discharge were investigated as well as the effects of ship speed and propeller action. The experimental study consisted of tests in a circulating water channel as well as tests in a towing tank. The tests in the water channel included measurements of the dilution of a released tracer for the following conditions: (1) an unobstructed flow in the channel, (2) a propeller operating in the channel, (3) a foreshortened model of a typical chemical tanker fixed in the water channel without a propeller, and (4) the same model but with an operating propeller. The tests in the towing tank included measurements of the dilution of a tracer released from an geometrically scaled, eight ft. long tanker model operating with and without a propeller. This work was undertaken to provide guidance to the U. S. Coast Guard in regard to minimizing the environmental impact of washwater discharged during tank cleaning operations. (Author)

AD-768 682/7GA PC$4.75/MF$1.45
Automation Industries Inc Silver Spring Md Vitro Labs Div
STATE-OF-THE ART REPORT ON MARINE SANITATION DEVICES.
Final rept.,
J. M. Rosenbusch. Jun 73, 168p USCG-D-11-73
Contract DOT-CG-32785-A

Descriptors: (*Sanitary engineering, *Ships), Reviews, Shipborne, Ship auxiliary equipment, Incinerators, Evaporation, Feasibility studies, Water pollution.
Identifiers: Sewage treatment, Activated sludge process, Physical chemical treatment, Boats, Water pollution control.

The report describes the problem of disposal of wastewater from recreational, commercial, and military vessels, with particular emphasis on recreational vessels. Contained in the report is a summary of marine sanitation devices (MSD) which are commercially available, and a breakdown of MSD research, development, test and evaluation (RDT and E) programs being funded by the federal government and private agencies. An analysis is made of vessel limitations and constraints, and the suitability of the various MSD systems is compared to the vessel requirements. The conclusions note the major problems of wastewater treatment both onboard recreational, commercial, and military vessels and at dockside and the technical and economic factors that must be considered in the selection of a marine sanitation device. (Author) Portions of this document are not fully legible.

AD-768 730/4GA PC$5.75/MF$1.45
Naval Undersea Center San Diego Calif
CALIFORNIA UNDERSEA AQUEDUCT RECONNAISSANCE: THE OCEANOGRAPHY (CUARO).
Research and Development Report, Jan 72-Feb 73, Robert H. Riffenburgh. Aug 73, 231p Rept no. NUC-TP-353

Descriptors: (*California, Water supplies), (*Water supplies, Underwater), (*Ocean currents, Ocean bottom), Ocean waves, Ocean bottom topography, Oceanographic data, Underwater light, Maps, Construction, Pacific Ocean.
Identifiers: Geostrophic flow, Aqueducts, Tsunamis.

The report discusses the possibility of conveying fresh water from northern to southern California via a subsurface offshore aqueduct (the California Undersea Aqueduct). The specific region investigated was between Crescent City and San Diego from the 20- to 200-m depth contour. All available data on relevant variables were analyzed to provide information for aqueduct planning decisions. The variables and analyses most influential in planning the California Undersea Aqueduct were divided into two categories: variables influencing the 100-year survival of the aqueduct(century risks) and variables influencing the construction and maintenance of the aqueduct. Waves, surges, tsunamis, density, and light do not appear on the basis of reconnaissance data to pose insurmountable problems. Surface, water column, and bottom currents, including upwelling and internal wave phenomena, may or may not be prohibitive; data are inadequate, and additional information must be obtained from in situ observations. Canyons are not an insurmountable threat, but will pose innovative engineering challenges and probably be quite expensive. Additional data will also be required on these processes. (Author)

AD-768 777/5GA PC$3.00/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
SELECTIVE WITHDRAWAL FROM BEECH FORK LAKE, BEECH FORK RIVER, WEST VIRGINIA: HYDRAULIC MODEL INVESTIGATION.
Final rept. Oct 72-Jan 73,
Terrence L. Gloriod, and Jospeh P. Bohan. Sep 73, 42p Rept no. AEWES-TR-H-73-14

Descriptors: (*Dams, *Hydraulic models), Model tests, Fluid flow, Walls, Velocity, Density, River currents, West Virginia.
Identifiers: *Beech Fork Lake, Wayne Country(West Virginia), Reservoirs, Stratification.

Tests were conducted on a 1:36-scale model of a portion of the proposed Beech Fork Lake and multilevel intake structure to determine the effects of the upstream topography and the geometry in the vicinity of the intake structure on the selective withdrawal capability of the structure. A 2500-ft-long by 1800-ft-wide area of the 40-ft-deep lake was modeled, and three alternative locations of the intake structure were investigated. Desnsity stratification caused by differentials in temperature in the prototype was simulated in the model by using saline and fresh water.

AD-768 779/1GA PC$6.25/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
ENLARGEMENT OF THE CHESAPEAKE AND DELAWARE CANAL: HYDRAULIC AND MATHEMATICAL MODEL INVESTIGATION.
Final rept. May 70-Aug 72,
Marden B. Boyd, Carl J. Huval, William H. Bobb, and Thomas C. Hill. Oct 73, 257p Rept no. AEWES-TR-H-73-16

Descriptors: (*Inland waterways, *Hydraulic models), Chesapeake Bay, Delaware Bay, Model tests, Fluid flow, Salinity, Tides, Maryland, Delaware, Mathematical models.
Identifiers: *Chesapeake and Delaware Canal, Delaware River.

A comprehensive physical model that correctly reproduced tides, tidal currents, and density currents throughout the the Chesapeake and Delaware Canal and the Delaware River was used to determine the effects of enlarging the 27-ft-deep by 250-ft-wide canal to dimensions of 35 by 450 ft on tides, currents, salinities, and the net transport of water through the canal. An existing numerical model was used for initial studies involving tides,

currents, and net flow changes due to the enlargement; and a second mathematical model was developed for before-and-after salinity determinations. As of this date, the enlargement of the canal is essentially complete, except for about one mile section at the eastern end; and the program included a test for this condition. (Author)

AD-768 780/9GA PC$3.50/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
SPILLWAY FOR LOCK AND DAM 26, MISSISSIPPI RIVER, MISSOURI AND ILLINOIS: HYDRAULIC MODEL INVESTIGATION.
Final rept.,
Noel R. Oswalt, and Glenn A. Pickering. Oct 73, 65p Rept no. AEWES-TR-H-73-15

Descriptors: (*Dams, *Hydraulic models), Design, Flow fields, Model tests, Illinois, Missouri.
Identifiers: *Spillways, *Locks(Waterways), Stilling basins, Riprap, Mississippi River.

Tests were conducted on two models of the Lock and Dam 26 spillway to determine discharge characteristics of the spillway, stilling basin performance, riprap requirements downstream from the structure, and gate vibration tendencies. The proposed gated structure, consisting of ten 110-ft-wide bays, will replace the existing dam. Tests to determine discharge characteristics revealed that data obtained in a previous model investigation could be used to determine discharge coefficients for the Lock and Dam 26 project. The stilling basin as originally designed resulted in unsatisfactory performance with only one gate open full. Several modifications to the basin were tested in an effort to effect better energy dissipation and spread flow downstream during single-gate operations. A stilling basin that resulted in satisfactory flow conditions was developed. Tests to determine the riprap requirements in the exit channel indicated that the protection will be needed for a distance of 1200 ft downstream from the basin. A protection plan was also developed. (Modified author abstract)

AD-768 865/8GA PC$3.00/MF$1.45
Clemson Univ S C Coll of Engineering
A SYSTEMS ANALYSIS OF WATER QUALITY SURVEY DESIGN.
Annual rept. no. 1, 1 Jun 72-1 Jun 73,
Lyle C. Wilcox, John F. Andrews, Thomas L. Drake, Ralph W. Gilchrist, and Bobby E. Gilliland. 22 Aug 73, 40p
Contract DADA17-72-C-2152

Descriptors: (*Water pollution, Surveying), (*Munitions industry, Water pollution), Design, Data processing systems, Models(Simulations), Flow charting.
Identifiers: Water quality, Environmental surveys, Systems analysis.

The design of water quality surveys is being investigated by an interdisciplinary team using systems analysis techniques. The class of surveys under study are nominally fifteen days in length and designed to characterize pollutant types and levels at the site being monitored. With the conduct of the survey restricted to a relatively short time period, it is imperative that the amount of useful data collected be maximized. The resources available to collect data are limited and a 'best' sampling and analysis program has to be chosen to maximize data collection, a difficult problem. This report reviews the first year's progress in formulating and implementing models for munitions manufacturing processes, site topology, measurement resources and a resource matching program. Also included is a survey of current data handling procedures and recommendations for improvements. (Modified author abstract)

BNWL-SA-4720/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
DEVELOPMENT OF A WATER TREATMENT PLANT OPERATION MANUAL USING AN ALGORITHMIC APPROACH.
C. A. Counts. 1972, 10p CONF-730545-1

Descriptors: (*Water, *Purification), Algorithms, Drinking water, Economics, Environment, Fresh water, Human populations, Inspection, Management, Operation.

For abstract, see NSA 28 07, number 17722.

COM-73-11658/4GA PC$5.25/MF$1.45
Capitol Region Council of Governments, Hartford, Conn.
NEWSPAPER RECYCLING PROGRAMS IN THE COMMUNITIES OF THE CAPITOL REGION AND THEIR IMPACT UPON THE WASTE NEWSPAPER INDUSTRY.
Final rept.,
Philip M. Block. Jun 73, 178p
Sponsored in part by New England Regional Commission, Boston, Mass.

Descriptors: (*Solid waste disposal, Newsprint), (*Bibliographies, Solid waste disposal), Dictionaries, Solid waste disposal, Collecting methods, Costs, Connecticut, Forecasting.
Identifiers: *Paper recycling, Secondary materials industry.

The report documents the experience of six communities of the region in municipal paper recycling. It presents numerous tools which municipalities may utilize to accomplish and evaluate a recycling program. It identifies the various policy decisions which must be made by various public and private sector groups. It contains a 56 page annotated bibliography plus a 13 page glossary.

COM-73-11716/0GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
URBAN AUTOMATED TRAFFIC CONTROL. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Sep 73,
Edward J. Lehmann. Oct 73, 82p* NTIS-WIN-73-065

Descriptors: (*Vehicular traffic control, *Urban areas), (*Automatic control, *Traffic engineering), (*Bibliographies, Vehicular traffic control), Abstracts, Traffic signals, Intersections, Detectors, Telemetry, Computer programming, Mathematical models, Systems analysis, Routing.
Identifiers: Route guidance systems, Automatic traffic control, Traffic lane signals.

The NTISearch bibliography contains 77 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. These abstracts cover the control of urban vehicular traffic movement by means of automatic synchronization of intersection and lane signals. This includes studies on sensing and telemetry devices, computer programming, models, system development, and route guidance systems. (Author)

COM-73-11735/0GA PC$7.25/MF$1.45
Connecticut Univ., Groton. Marine Sciences Inst.
A DETERMINATION OF BUDGETS OF HEAVY METAL WASTES IN LONG ISLAND SOUND. PART I.
Rept. no 1 Annual Apr 72-Apr 73,
Peter Dehlinger, W. F. Fitzgerald, S. Y. Feng, D. F. Paskausky, and R. W. Garvine. Jun 73, 103p
NOAA-73092802
See also Part 2, COM-73-11736.

Descriptors: (*Long Island Sound, *Trace elements), (*Water pollution, Long Island Sound), Metals, Ocean currents, Mercury(Metal), Lead(Metal), Cadmium, Zinc, Circulation, Water chemistry, Absorption(Biology), Shellfish, Oysters, Estuaries, Suspended sediments, Connecticutt River, Water analysis, Copper, Nickel, Tidal currents.
Identifiers: Sea Grant program, Baseline measurements.

This study consists of five integrated research projects with the objective of determining budgets of heavy metal wastes in Long Island Sound. The projects concern: (1) the fates and concentrations of heavy metals in the water column; (2) the concentrations and effects of these metals in oysters; (3) the water circulation patterns which control water renewal times and flushing rates; (4) the structure and motion of the outflow of the Connecticut River into Long Island Sound; and (5) the transport of suspended materials in the Sound. Emphasis during the first year was on the eastern area of the Sound. The study is presented in two parts. This volume, as Part one contains the first three projects.

COM-73-11736/8GA PC$6.00/MF$1.45
Connecticut Univ., Groton. Marine Sciences Inst.
A DETERMINATION OF BUDGETS OF HEAVY METAL WASTES IN LONG ISLAND SOUND. PART II.
Rept. no. 1 (Annual) Apr 72-Apr 73,
Peter Dehlinger, W. F. Fitzgerald, S. Y. Feng, D. F. Paskausky, and R. W. Garvine. Jun 73, 79p
NOAA-73092803
See also Part 1, COM-73-11735

Descriptors: (*Long Island Sound, *Trace elements), (*Water pollution, Long Island Sound), Connecticutt River, Aerial photography, Plumes, Discharge, Salinity, Hxdrography, Mixing, Suspended sediments, Sediment transport, Concentration(Composition), Water analysis.
Identifiers: Sea Grant program.

This study consists of five integrated research projects with the objective of determining budgets of heavy metal wastes in Long Island Sound. The projects concern: (1) the fates and concentrations of heavy metals in the water column; (2) the concentrations and effects of these metals in oysters; (3) the water circulation patterns which control water renewal times and flushing rates; (4) the structure and motion of the outflow of the Connecticut River into Long Island Sound; and (5) the transport of suspended materials in the Sound. Emphasis during the first year was on the eastern area of the Sound. The study is presented in two parts. This volume, as Part 2 contains reports on projects designated as 4 and 5.

COM-73-11773/1GA PC$7.00/MF$1.45
Arizona Univ., Tucson. Dept. of Hydrology and Water Resources.
WORTH OF HYDROLOGIC DATA FOR SHORT-TERM FORECASTS OF FLOODS,
MosheSniedovich, Chester C. Kisiel, Lucien Duckstein, and Donald R. Davis. Jul 73, 100p
NOAA-73092504
Contract NOAA-2-34108

Descriptors: (*Hydrology, *Flood forecasting), Flood plains, Flood control, Warning systems, Remote sensing, Data processing, Evaluation, Effectiveness, Mathematical models, Methodology.

A methodology is developed for the evaluation of the worth of the hydrologic data for short-term forcasts of floods. The effectiveness of the forecasts is measured in terms of the entire system under condiseration - that is the flood plain, rather than solely in hydrologic terms such as the mean error of forecast. Both the actual and potential worth of the forecasts are studied with emphasis on the effects of warning time, forecast error, response of the population, and hydrometric network on the end product of the system - that is, the social and economic improvement of the flood plain. An adequate evaluation, especially concerning the potential worth of the hydrologic data, requires a multi-disciplinary study involving hydrologists, economists, sociologists, phycholo-

gists and flood plain authorities. In the light of continuous improvement in the scientific and technologic aspects involved in the forecasting system there is a need for a continuous reevaluation of the forecasting system as a potential alternative in flood control projects especially as a complementary alternative to the classical ones such as zoning, and structures. (Modified author abstract)

COM-73-11786/3GA Reprint
Wisconsin Univ., Madison. Inst. for Environmental Studies.
DYNAMIC SURFACE TEMPERATURE STRUCTURE OF THERMAL PLUMES,
F. L. Scarpace, and T. Green, III. 28 Aug 72, 17p WIS-SG-73-337 NOAA-73101001
Grant NOAA-043-158-11
Revision of report dated 13 June 72.
Pub. in Water Resources Research, v9 n1 p138-153 Feb 73.

Descriptors: (*Water pollution, *Cooling water), (*Water pollution, Plumes), Mixing, Temperature gradients, Electric power plants, Oceans, Lakes, Surface temperature.
Identifiers: Sea Grant program, *Thermal pollution.

Airborne thermal imagery is used to show that thermal plumes often vary rapidly in space and time, although both the initial thermal effluent and the receiving water change very little. The imagery is buttressed by simultaneous data taken from boats. The rapid variations can cast doubt on the validity of some standard methods of measuring thermal plumes. The plume is shown to be sometimes dominated by a series of concentric thermal fronts that spread radially outward from the outfall. These are described, and various tentative explanations for their occurrence are given. (Author)

COM-73-11788/9GA Reprint
Wisconsin Univ., Madison. Marine Studies Center.
THE POINT BEACH THERMAL PLUME,
T. Green, T. MacKenzie, S. Roffler, F. Scarpace, and C. Sundby. 1973, 11p WIS-SG-73-336 NOAA-73101010
Pub. in Proceedings of the Conference on Great Lakes Research (15th), p588-596 Apr 72.

Descriptors: (*Cooling water, *Plumes), (*Electric power plants, *Lake Michigan), Water pollution, Temperature measurement, Turbulence, Internal waves, Aerial surveys, Wisconsin.
Identifiers: Sea Grant Program, *Point Beach Power Plant, *Thermal pollution, Thermal fronts, Thermal images.

Work aimed at describing a thermal plume is summarized. A comprehensive set of thermal imagery taken each five minutes for at least an hour on four separate occasions shows the surface temperature structure to be often dominated by a series of concentric thermal fronts spreading radially outward from the outfall. Similar fronts were seen in nearby plumes. Sharp temperature changes of over 2C occur along these fronts. Concurrent surface temperature data taken by a ship-mounted radiation thermometer provides ground truth. The imagery has been analyzed using a densitometer to provide quantitative estimates of the speed and intensity of the fronts. On other occasions, detailed aerial photography of large numbers of drogues and a photogrammetric data reduction technique gave rather accurate information on the plume current structure. Internal waves and thermal turbulence associated with the bottom interface were measured using a fixed vertical array of five fast response thermocouples. Power spectra are presented. Rapid variations of temperature at the fixed point were encountered, which point to difficulties in interpreting data taken following the usual towed thermistor array procedure. (Author)

COM-73-11798/8GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
CONSTRUCTION MANAGEMENT. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Oct 73,
Edward J. Lehmann. Nov 73, 59p* NTIS-WIN-73-075
Supersedes NTIS-PK-76.

Descriptors: (*Construction management, *Bibliographies), Project management, Highways, Cost control, Schools, Residential buildings, Productivity, Management engineering, Personnel development, Civil engineering.
Identifiers: Construction techniques, Industrialized housing.

The NTISearch bibliography contains 54 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The management aspects of various types of construction are covered. Although most of these abstracts deal with building construction, other types are included. The topics concern such areas as labor, costs, design, quality control, and planning. (Author)

COM-73-11800/2GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
LAND RECLAMATION IN MINING AREAS. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-May 73,
Axel C. Ringe. Nov 73, 30p* NTIS-WIN-73-077
Supersedes NTIS-PK-32.

Descriptors: (*Land reclamation, *Mining), (*Bibliographies, Land reclamation), Coal mines, Mine water, Water pollution, Strip mining, Underground mining, Tailings, Spoil, Plant growth, Reforestation, Vegetation, Soil fertility.
Identifiers: Mine acid drainage, Strip mine wastes, Water pollution control.

The NTISearch bibliography contains 25 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. Cited reports include research on techniques for the reclamation of land by revegetation and control of acid mine drainage in strip mine, spoil bank and tailings areas. (Author)

COM-73-11801/0GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
UNDERWATER CONSTRUCTION AND MINING. A BIBLIOGRAPHY WITH ABSTRACTS,
Rept. for 1964-Oct 73,
Edward J. Lehmann. Oct 73, 77p NTIS-WIN-73-078
Supersedes NTIS-PK-75.

Descriptors: (*Underwater construction, *Bibliographies), Mining engineering, Manganese nodules, Undersea mineral deposits, Salvage, Ocean bottom, Tools, Underwater cutting, Underwater explosions, Excavation.
Identifiers: *Underwater mining.

The NTISearch bibliography contains 72 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. Included in this bibliography on underwater construction and mining are reports on foundation construction; underwater salvage; explosive excavation; manganese nodule mining, equipment, and planning. (Author)

COM-73-11803/6GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
EROSION CONTROL METHODOLOGY. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Oct 73,
Elizabeth A. Harrison. Oct 73, 73p* NTIS-WIN-73-080
Supersedes NTIS-PK-23.

Descriptors: (*Erosion control, *Bibliographies), Highways, Beach erosion, Planning, Construction, Environmental surveys, Roads, Soil erosion, Landscaping, Forestry.

The NTISearch bibliography contains 68 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. These abstracts on erosion control cover planning, construction, and environmental topics. Most concern roadside and beach erosion although other types are included. (Author)

CONF-730817-1/GA PC$3.25/MF$1.45
Oak Ridge National Lab., Tenn.
ANALYTICAL TECHNIQUES FOR DETERMINING LEVELS AND FATES OF TRACE ELEMENTS IN A FOSSIL-FUELED STEAM PLANT.
J. C. White, W. S. Lyon, J. A. Carter, C. Feldman, and W. D. Shults. 1973, 25p

Descriptors: (*Air, *Chemical analysis), (*Coal, Chemical analysis), (*Fossil fuel power plants, *Monitoring), (*Power plants, Monitoring), Absorption spectroscopy, Activation analysis, Fossil fuels, Gaseous wastes, Isotope dilution, Mass spectroscopy, Neutron beams, Neutron reactions, Nondestructive analysis, Nuclear reactions, Quantitative chemical analysis, Trace amounts.

For abstract, see NSA 28 08, number 17850.

EIS-AA-73-1734-F/GA PC$12.50/MF$1.45
Forest Service, Milwaukee, Wis. Eastern Region.
THE USE OF HERBICIDES IN THE EASTERN REGION.
Final environmental impact statement.
31 Oct 73, 206p USDA-FS-FES(Adm)-73-3 ELR-73-1734
Supersedes report No. EIS-AA-72-5014-D.

Descriptors: (*Environmental impact statements, *Herbicides), Forest land, Vegetation, Indiana, Maine, Michigan, Minnesota, Missouri, New Hampshire, New York, Ohio, Pennsylvania, Vermont, West Virginia, Illinois, Wisconsin, Safety, Toxicity, Management.

The proposal outlines guidelines and restrictions affecting the Forest Service use of eight principle and six minor herbicides on National Forests in Illinois, Indiana, Maine, Michigan, Minnesota, Missouri, New Hampshire, New York, Ohio, Pennsylvania, Vermont, West Virginia and Wisconsin. An estimated 50,000 acres of the 12,000,000 acres of National Forest land in the Eastern Region will be involved annually. Herbicide uses are related to timber management, special use permits, forest roads, wildlife and recreation activities where other alternative methods of controlling undesirable plant species are not feasible. Policies, guidelines and monitoring practices presented in this Statement modify past practices by requiring tighter controls on herbicide use and restricting use to a few specific, well-documented and acceptable herbicides. This statement also specifies maximum dose rates, approved application techniques and equipment, and the procedural requirements for the review of all herbicide applications. Impacts on non-target organisms are presented for each of the fourteen herbicides based on a recent summary of studies.

EIS-AA-73-1744-F/GA PC$3.00/MF$1.45
Coast Guard, Washington, D.C.
THE PROPOSED BILL TO IMPLEMENT THE INTERNATIONAL CONVENTION RELATING TO INTERVENTION ON THE HIGH SEAS IN CASES OF OIL POLLUTION CASUALTIES, 1969.
Final environmental impact statement.
5 Nov 73, 35p* ELR-73-1744
Supersedes report No. EIS-AA-73-0991-D.

Descriptors: (*Environmental impact statements, *Shore protection), (*Coasts, Environmental impact statements), Oils, Ocean environments, Legislation, Damage control, Chemical compounds, Disposal.
Identifiers: Oil pollution, Oil spills.

Legislative action consists of a bill to implement the International Convention relating to intervention on the high seas in cases of oil pollution casualties, 1969. The bill enables the government to take measures on the high seas to prevent, mitigate, or eliminate an oil discharge when that discharge endangers the U.S. coastline or related interests. Measures to reduce or eliminate the discharge may have adverse environmental effects.

EIS-AZ-73-1707-D/GA PC$4.25
Federal Highway Administration, Phoenix, Ariz. Arizona Div.
PROJECT I-19-1(25), OTERO-CARMEN SECTION IN SANTA CRUZ COUNTY, ARIZONA.
Draft Supplement to Final environmental impact statement.
20 Oct 73, 44p FHWA-AZ-EIS-71-DSF ELR-73-1707
See also PB-201 785-F. Prepared by Arizona State Highway Dept.

Descriptors: (*Environmental impact statements, *Highways), (*Arizona, Environmental impact statements), Revisions, Relocation, Interchanges, Roads, Improvement.
Identifiers: Santa Cruz County(Arizona), Interstate highway 19.

Location changes of the previously reported project are proposed between stations 890 and 990, and the position of the Tumacacori traffic interchange is proposed to be relocated from approximate station 982 to approximate station 961. The relocations as discussed herein are environmentally more satisfactory than those initially planned. Alignment and Traffic Interchange changes will diminish adverse environmental impact.

EIS-CA-1681-F-3/GA PC-GPO/MF$1.45-NTIS
Department of the Interior, Washington, D.C.
GEOTHERMAL LEASING PROGRAM. VOLUME III. APPENDICES A THROUGH H. PROPOSED GEOTHERMAL. LEASING AND OPERATING REGULATIONS.
Final environmental impact statement.
24 Oct 73, 701p ELR-73-1681-F-3
Supersedes report Nos. PB-203 102-D, and PB-208 954. See also EIS-CA-73-1681-F-4.
Paper copy available from GPO $5.60 as stock no. SN-2400-00791.

Descriptors: (*Environmental impact statements, *Geothermal prospecting), (*California, Geothermal prospecting), Imperial Valley, Clear Lake, Mono Lake, Regulations, Public land, Classifications, Geology.
Identifiers: *Geothermal energy.

The report discusses the following topics: July 23, 1973, proposed leasing regulations; July 23, 1973, proposed operating regulations; comments on July 23, 1973, proposed regulations; November 29, 1972, proposed leasing regulations; November 29, 1972, proposed operating regulations; comments on November 29, 1972, proposed regulations; July 23, 1971, proposed leasing and operating regulations; May 3, 1972, proposed unit plan regulations; summary of comments and departmental responses; vapor dominated hydrothermal systems; classification of public lands.

EIS-CA-73-1681-F-1/GA PC-GPO/MF$1.45-NTIS
Department of the Interior, Washington, D.C.
GOETHERMAL LEASING PROGRAM. VOLUME I. PROMULGATION OF LEASING AND OPERATING REGULATIONS.
Final environmental impact statement.
24 Oct 73, 519p ELR-73-1681-F-1
Supersedes report Nos. PB-203 102-D, and PB-208 954 . See also EIS-CA-73-1681-F-2.
Paper copy available from GPO $4.20 as stock no. SN-2400-00789.

Descriptors: (*Environmental impact statements, *Geothermal prospecting), (*California, Geothermal prospecting), Imperial Valley, Clear Lake, Mono Lake, Environmental surveys, Regulations, Substitutes, Leasing, Fuel consumption, Exploration, Electric power generation, Land use.
Identifiers: *Geothermal energy.

Volume I of this statement primarily relates to the promulgation of leasing and operating regulations for implementation of the geothermal leasing program as authorized by the Geothermal Steam Act of 1970. The proposal is described in Chapter I. The national energy situation, geothermal energy resources and their potentials, description of resource development and production phases and a broad description of the environmental setting of the western states are included in Chapter II. The promulgation of leasing and operating regulations, the environmental impacts of the proposed action, mitigating measures, adverse impacts which cannot be avoided, the relationships between local short-term uses of man's environment and maintenance and enhancement of long-term productivity, and irreversible and irretrievable commitments of resources are discussed in detail in Chaper III. Chapter IV includes discussions of alternatives for timing of actions, environmental provisions of regulations, leasing options, Federal and private exploration and development and electrical energy sources.

EIS-CA-73-1681-F-2/GA PC-GPO/MF$1.45-NTIS
Department of the Interior, Washington, D.C.
GEOTHERMAL LEASING PROGRAM. VOLUME II. LEASING OF GEOTHERMAL RESOURCES IN THREE CALIFORNIA AREAS.
Final environmental impact statement.
24 Oct 73, 547p ELR-73-1681-F-2
Supersedes report Nos. PB-203 102-D, and PB-208 954. See also EIS-CA-73-1681-F-3.
Paper copy available from FPR $5.85 as stock no. SN-2400-00790.

Descriptors: (*Environmental impact statements, *Geothermal prospecting), (*California, Geothermal prospecting), Imperial Valley, Clear Lake, Mono Lake, Environmental surveys, Electric power generation, Leasing, Exploration, Land use.
Identifiers: *Geothermal energy.

This volume of the Geothermal Leasing Program final impact statement contains the individual environmental statements for the leasing of federally owned geothermal resources for development in three specific areas: (a) Clear Lake-Geysers; (b) Mono Lake-Long Valley; and (c) Imperial Valley, all in California. It also includes a summary of the written comments received and departmental responses relative to the Draft Environmental Impact Statement issued in 1971; comments and responses on the Draft Environmental Impact Statement; consultation and coordination in the development of the proposal and in the preparation of the Draft Environmental Statement; and coordination in the review of the Draft Environmental Statement.

EIS-CA-73-1681-F-4/GA PC-GPO/MF$1.45-NTIS
Department of the Interior, Washington, D.C.
GEOTHERMAL LEASING PROGRAM. VOLUME IV. APPENDIX I. COMMENTS ON DRAFT IMPACT STATEMENT AND PROPOSED REGULATIONS.
Final environmental impact statement.
24 Oct 73, 728p ELR-73-1681-F-4
Supersedes report Nos. PB-203 102-D, and PB-208 954. See also EIS-CA-73-1681-F-3.
Paper copy available from GPO $5.65 as stock no. SN-2400-00788.

Descriptors: (*Environmental impact statements, *Geothermal prospecting), (*California, Geothermal prospecting), Imperial Valley, Clear Lake, Mono Lake, Public opinion, Leasing, Regulations.
Identifiers: *Geothermal energy.

This volume contains comments received from Federal, State, local and individual interests on the leasing and operating regulations and the Draft Environmental Impact Statement for the Geothermal Leasing Program and the supplement to the draft statement.

EIS-CA-73-1720-D/GA PC$10.25
Federal Highway Administration, Sacramento, Calif. California Div.
A CONTROLLED ACCESS 4-LANE FREEWAY, ROUTE 87, NORTH OF TAYLOR STREET TO INTERSTATE 280 (WEST SAN CARLOS STREET) IN THE CITY OF SAN JOSE, SANTA CLARA COUNTY, CALIFORNIA.
Draft environmental impact statement.
29 Oct 73, 163p FHWA-CA-EIS-1973-10-D ELR-73-1720
Prepared by California State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*California, Environmental impact statements), Construction, Freeways, Eminent domain, Relocation, Air pollution.
Identifiers: San Jose(California), Santa Clara County(California), California route 87.

The proposed highway improvement consists of a four-lane freeway on Route 87 between Taylor Street and Interstate Route 280 at West San Carlos Street, a distance of 1.5 miles, and a realignment and widening of the Guadalupe Parkway between Mission Street and Taylor Street in the City of San Jose. Environmental impacts: The more significant are the loss of housing units, displacement of people, increases in noise and (microscale) air pollution, disruption of neighborhoods, aesthetic appearance, the relief of downtown traffic congestion, the reduction in predicted accidents, the improvement of traffic circulation and access, and favorable economic effects in the downtown area. Less significant and short-term impacts include removal of some vegetative life, a temporary increase in water pollution of the Guadalupe River, loss of a few small animals, and effects related to construction activities, e.g. dust, noise, traffic disruption, etc. Mitigation measures include landscaping, installation of noise attenuators, special architectural treatment of structures, and certain construction procedures to reduce short-term effects.

EIS-CA-73-1726-F/GA PC$3.00/MF$1.45
General Services Administration, Washington, D.C.
DISPOSAL OF PORTION, LEWISTON GOVERNMENT CAMP, TRINITY COUNTY, CALIFORNIA.
Final environmental impact statement.
30 Oct 73, 20p GSA-I-CALIF-619-EIS-F ELR-73-1726
Supersedes report No. PB-204 019-D.

Descriptors: (*Environmental impact statements, *Public buildings), (*California, Environmental impact statements), Government, Disposal, Land.
Identifiers: Trinity County(California).

The General Services Administration proposes to dispose of a portion of the Lewiston Government Camp as follows: Approximately 83 acres, 90 housing units, 28 other buildings, and all utility systems will be sold as one unit by sealed bid sale to the public; The gymnasium with underlying and surrounding 3 acreas of land will be assigned to the

Department of Health, Education, and Welfare (DHEW) for conveyance to the Lewiston School District. There are no irreversible or irretrievable effects on the environment expected to occur due to the outlined disposal of the Lewiston Government Camp.

EIS-CA-73-1738-F/GA PC$12.75/MF$1.45
Federal Highway Administration, Sacramento, Calif. California Div.
HIGHWAY IMPROVEMENT ON ROUTES 106 AND 30 IN SAN BERNARDINO COUNTY, THE CITY OF SAN BERNARDINO AND THE CITY OF REDLANDS BETWEEN F.A.I. ROUTE 10 NEAR TENNESSEE STREET AND EXISTING ROUTE 30 AT HIGHLAND AVENUE.
Final environmental impact statement.
2 Nov 73, 212p FHWA-CA-EIS-73-01-F ELR-73-1738
Supersedes report No. EIS-CA-73-0359-D. Prepared by State of California Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*California, Environmental impact statements), Construction, Central city, Traffic engineering, Eminent domain, Relocation.
Identifiers: California route 106, California route 30, San Bernardino(California), Redlands(California), Bernardino County(California).

The project is a six-lane freeway comprising a connecting link between Interstate Route 10 and existing State Route 30 to provide a continuous freeway system around the major portion of the city of San Bernardino and to provide an all-weather crossing of the Santa Ana River. The project could cause sound problem at 11 locations. Ten locations are residential and one is a school. Sound attenuators are proposed at four locations. No total pollutant load increase is expected. Seventy-seven single family residences, 11 apartments, a 60-space mobile home park and 4 commercial units will be displaced. Twenty-three of the single family residences are owned by the State. Ample replacement housing is available.

EIS-CA-73-1741-F/GA PC$5.50
Bureau of Reclamation, Washington, D.C.
PROPOSED IRRIGATION DISTRIBUTION SYSTEM FOR POND-POSO IMPROVEMENT DISTRICT (PL 984), KERN COUNTY, CALIFORNIA.
Final environmental impact statement.
5 Nov 73, 66p ELR-73-1741, FES-73-63
Supersedes report No. EIS-CA-72-5212-D.

Descriptors: (*Environmental impact statements, *Irrigation canals), (*California, Environmental impact statements), Irrigation pipes, Pumping stations, Water supply, Farms, Right of way acquisition, Water quality.
Identifiers: Kern County(California).

The proposal is for the construction by the Pond-Poso Improvement District of an irrigation distribution system consisting of lined and unlined canals, pipelines, pumping plants, and related works located in Kern County about 25 miles northwest of Bakersfield, Ca. This distribution system would convey 67,000 acre-feet of water per year from the California Aqueduct to about 22,300 acres of district lands where it will be used for irrigation. The principal environmental impact of the proposed project facilities on the Pond-Poso Improvement District lands will be the continued use of the district lands for agricultural production. The imported water supply to the district would alleviate the ground-water overdraft, aid in halting land subsidence, and improve groundwater quality over that which would exist without the importation.

EIS-CO-73-1689-F/GA PC$10.75/MF$1.45
Rural Electrification Administration, Washington, D.C.
230 KV TRANMISSION TAP LINE TO STEAMBOAT SPRINGS AND SUBSTATION, MONTROSE, COLORADO.
Final environmental impact statement.
24 Oct 73, 173p USDA-REA-ES(ADM)-73-6-F ELR-73-1689
Supersedes report no. EIS-CO-73-1038-D.

Descriptors: (*Environmental impact statements, *Transmission lines), (*Colorado, Environmental impact statements), Construction, Electric power generation, Electric substation, Electric power distribution.
Identifiers: Routt County(Colorado).

The project proposes construction of 6.5 miles of 230 kV transmission line from a point on the U.S. Bureau of Reclamation's Hayden-Archer 230 kV transmission line to Steamboat Springs and a 230/69 kV 30/4/50 MVA Substation Steamboat Springs in Routt County, Colorado. The proposed transmission line and substation will have only a small impact on the environment, primarily during contruction, and will be only a minor intrusion on the landscape. Every effort is being made to minimize the environmental impact caused by the proposed facilities. The proposed line and substation will make it possible for Colorado-Ute Electric Association, Inc., to improve service reliability and expand power supply capability to a member system in a fast developing part of its service area.

EIS-CO-73-1700-D/GA PC$12.50
Environmental Protection Agency, Denver, Colo. Region VIII.
METROPOLITAN DENVER SEWAGE DISPOSAL DISTRICT NO. 1. COMMERCE CITY, COLORADO. PROJECT NO. C80317, AND C080327.
Draft environmental impact statement.
25 Oct 73, 209p ELR-73-1700

Descriptors: (*Environmental impact statements, *Sewage disposal), (*Colorado, Environmental impact statements), Water treatment, Recreational facilities, Water supply, Effluents, Aquatic animals, Esthetics, South Platte River.
Identifiers: Denver sewage treatment project, Commerce City(Colorado).

The wastewater treatment plant of the Metropolitan Denver Sewage Disposal District No. 1 (Metro) is located adjacent to the South Platte River in Commerce City, CO. Metro is responsible for providing sewage treatment service to a major portion of the Denver metropolitan area. The present metro treatment plant has a total capacity of 98 million gallons of sewage per day (mgd) to meet 1978 effluent standards. The proposed project at the present plant site would increase the treatment plant's capacity by 70 mgd, to provide a total treatment capacity of 168 mgd. New systems to be added include: modification of existing secondary scum clarifiers, four 150-foot-diameter primary clarifiers, ten 140-foot-diameter secondary clarifiers, a pure oxygen aeration system and facilities for mechanical screening, grit removal, sludge pumping and treatment, and chlorination. These additions would be located south of the existing plant facilities in the area presently occupied by the ash lagoons. The effluent from the proposed plant expansion would discharge into the South Platte River at the present plant outfall site. Environmental impacts include water quality; an improvement in the aquatic environment of the river and consequent enhancement of recreational and aesthetic values; and some odor and noise problems.

EIS-DE-73-1725-D/GA PC$3.00
Postal Service, Bala-Cynwyd, Pa. Philadelphia Area Facilities Office.
UNITED STATE POST OFFICE, NEWARK, DELAWARE.
Draft environmental impact statement.
30 Oct 73, 16p ELR-73-1725

Descriptors: (*Environmental impact statements, *Public buildings), (*Delaware, Environmental impact statements), Construction, Community development, Mail.
Identifiers: Newark(Delaware), New Castle County(Delaware).

The project proposes construction of a U.S. Post Office at the southeast corner of Delaware Route 273 and Delaware Avenue, Newark, New Castle County, Delaware, to provide for expanded postal services in Newark and surrounding areas. The purposed action will have a minor negative impact caused by the elimination of a portion of a small farm, trees and other vegetation and its replacement with a building and parking areas balanced against an increase in postal service efficiency for an expanding urban community. It will be an aesthetically pleasing structure on a site which is scheduled for landscape beautification that will include new trees, shrubbery and lawns.

EIS-FL-73-1698-F/GA PC$8.00/MF$1.45
Federal Highway Administration, Tallahassee, Fla. Florida Div.
IMPROVEMENT OF STATE ROAD 80 FROM STATE ROAD 700 TO I-95, PALM BEACH COUNTY, FLORIDA.
Final environmental impact statement.
25 Oct 73, 117p FHWA-FLA-EIS-73-3-F ELR-73-1698
Supersedes report No. EIS-FL-73-0437-D. Prepared by Florida State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Florida, Environmental impact statements), Traffic engineering, Construction, Eminent domain, Relocation.
Identifiers: Florida route 80, Palm Beach County(Florida).

The proposed project is the improvement of State Road 80 between I-95 and State Road 700 in Palm Beach County, Florida. Widening to four lanes in rural areas and six lanes in urban areas is proposed with realignment in the vicinity of State Road 700 to intersect with the approved new alignment of State Road 80 between State Road 700 and Belle Glade. Environmental impacts will be some displacement of residences and businesses. No conservation or natural environmental problems are foreseen. Air, noise and water pollution will not directly result from the project. Water quality will not be affected. Safety and ease of access of County residents and through travelers will be increased. Existing neighborhoods will not be divided. No Section 4(f) lands are involved.

EIS-HI-73-1712-D/GA PC$6.25
Hawaii Volcanoes National Park.
PROPOSED WILDERNESS AREAS, HAWAII VOLCANOES NATIONAL PARK, HAWAII.
Draft environmental impact statement.
29 Oct 73, 85p ELR-73-1712, DES-73-68

Descriptors: (*Environmental impact statements, *National parks), (*Hawaii, Environmental impact statements), Natural resources, Management, Wildlife, Ecology, Recreational facilities.
Identifiers: Hawaii Volcanoes National Park.

The National Park Service proposes that 123,100 acres of Hawaii Volcanoes National Park be designated as wilderness. An additional 7,850 acres in Units 2 and 3 are proposed as potential wilderness additions to be added to wilderness by the Secretary of the Interior when they qualify under the terms of the Wilderness Act. The wilderness proposal will perserve diverse segments of the Island of Hawaii in an undeveloped state--from the 13,600-foot summit of Mauna Loa to the Puna and Kau Coasts, and landscape ranging from barren lava to dense tropical forests and dry coastal reaches with numerous archeological sites. Dominant impacts are scientific, cultural, and social in that much of the park will be retained in an undeveloped state, thereby preserving its unique

resources while still providing for public use. Other effects include strict control of research projects, increased management and research costs, and eventual rationing of recreation use.

EIS-HI-73-1715-D/GA PC$12.00
Hawaii Volcanoes National Park.
PROPOSED MASTER PLAN, HAWAII VOLCANOES NATIONAL PARK, HAWAII.
Draft environmental impact statement.
29 Oct 73, 196p ELR-73-1715, DES-73-66

Descriptors: (*Environmental impact statements, *National parks), (*Hawaii, Environmental impact statements), Natural resources, Management, Ecology, Geology, Volcanoes, Research.
Identifiers: Hawaii Volcanoes National Park.

The National Park Service proposes a plan to conserve and protect the unique resources of Hawaii Volcanoes National Park for expanded public use and for continued volcanic research by the U.S. Geological Survey. This includes acquisition of new lands, control of exotic plant and animal species to protect native populations, and expansion of opportunities for visitor use of resources. As a result of the proposed action, approximately 124,000 acres of new land will be preserved under national park status. This land, along with the existing park, will remain in ecological state resembling, as nearly as possible, those environmental conditions that existed before Europeans introduced competing flora and fauna. Expanded public use opportunities will give the visitor a greater variety of experience from concentrated use around Kilauea Volcano to a wilderness experience in the remote backcountry areas. Also as a result of the proposal, there will be increased costs, particularly with regard to land acquisition and management of endemic Hawaiian ecosystems. Direct impact on the land will result mainly from construction of new roads and campgrounds.

EIS-HI-73-1721-D/GA PC$9.00
Hawaii Volcanoes National Park.
NATURAL RESOURCES MANAGEMENT PLAN, HAWAII VOLCANOES NATIONAL PARK, HAWAII.
Draft environmental impact statement.
29 Oct 73, 136p ELR-73-1721, DES-73-67

Descriptors: (*Environmental impact statements, *National parks), (*Hawaii, Environmental impact statements), Natural resources, Management, Ecology, Volcanoes.
Identifiers: Hawaii Volcanoes National Park.

The project proposes to propagate rare and endangered plant species, reintroducing rare plants into former range, protecting rare endemic biota from depredation by feral goats and pigs, and reestablishing and nurturing remnants of endemic Hawaiian ecosystems. The plan is aimed at fulfilling applicable Congressional mandates for a natural category park. The beneficial impact of this action is that it will again allow the park's native Hawaiian ecosystems to operate largely without the influence and destruction of modern man, his activities, and the exotic species introduced by him. Adverse effects of the plan are 46 miles of interior fences which will result.

EIS-HI-73-1778-D/GA PC$3.25
Coast Guard District (14th), Honolulu, Hawaii.
PROPOSED CONSTRUCTION OF THE WATERFRONT AT THE U.S. COAST GUARD BASE, LOCATED ON SAND ISLAND, CITY AND COUNTY OF HONOLULU, STATE OF HAWAII.
Draft environmental impact statement.
12 Nov 73, 21p ELR-73-1778

Descriptors: (*Environmental impact statements, *Harbors), (*Hawaii, Environmental impact statements), Retaining walls, Rebuilding, Improvement, Wharves, Esthetics, Water pollution.
Identifiers: Waterfront development, Honolulu(Hawaii).

It is proposed to reconstruct approximately 1,500 lineal feet of the waterfront at the U.S. Coast Guard Base, Honolulu located on Sand Island, city and county of Honolulu, Hawaii. The proposed reconstruction includes replacing deteriorated timber wharf with a new concrete wharf, replacing or repairing undermined concrete retaining wall for shore protection, constructing buried utility lines to serve the ships moored at the wharf, and landscaping. Visual appearance of the area will be enhanced. Water quality will be improved. No important adverse effects are expected.

EIS-IA-73-1710-D/GA PC$12.00
Army Engineer District, Rock Island, Ill.
AMES LAKE, SKUNK RIVER, IOWA.
Draft environmental impact statement.
29 Oct 73, 197p ELR-73-1710

Descriptors: (*Environmental impact statements, *Multiple purpose reservoirs), (*Iowa, Environmental impact statements), Flood control, Water quality, Recreational facilities, Water pollution, Right of way acquisition, Land use, Wildlife, Ames Lake, Skunk River.
Identifiers: Ames(Iowa).

The proposal is for construction of the authorized Ames Lake project northeast of Ames, IA. Environmental impacts are described.

EIS-IL-73-1690-D/GA PC$5.25
Federal Highway Administration, Springfield, Ill. Illinois Div.
FA 406, FAI 74 TO 4.5 MILES SOUTH OF TREMONT, TAZEWELL COUNTY, ILLINOIS.
Draft environmental impact statement.
24 Oct 73, 62p FHWA-ILL-EIS-73-4-D ELR-73-1690
Prepared by Illinois State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Illinois, Environmental impact statements), Freeways, Traffic engineering, Eminent domain, Relocation.
Identifiers: Tazewell County(Illinois).

The proposed freeway F. A. 406, a fully access controlled, four-lane facility will begin at the present Illinois Route 121 intersection with Interstate 74 near Morton, Illinois and will proceed southerly, coincidental with and/or paralleling the existing alignment of Illinois Route 121, for a distance of 11.3 miles, to a point approximately 4 1/2 miles south of Tremont, Illinois in Tazewell County. The project is a segment of the proposed total FA 406 freeway from Morton to Lincoln, Illinois. Implementation of the project proposal would involve a non-reversible commitment of natural and human resources, a diversion of approximately 300 acres of farm land; relocation of affected farm residences; changes in the ambient noise levels, air pollution concentrations, are topography, modes of physical transportation, area development and the local economic spectrum. The most pronounced adverse environmental effects involves the displacement of families, and the use of productive farm lands which must be weighed against long term economic development and the provisions of safe, efficient transportation.

EIS-IL-73-1745-F/GA PC$5.75/MF$1.45
Federal Highway Administration, Springfield, Ill. Illinois Div.
F.A. ROUTE 2, S.B.I. ROUTE 2, U.S. ROUTE 51, SECTION 62ZSB, MCLEAN COUNTY. THE USE OF U.S. ROUTE 51 AND KINGSLEY STREET AS A TRAFFIC COUPLE IN NORMAL, ILLINOIS.
Final environmental impact statement.
5 Nov 73, 71p FHWA-ILL-EIS-72-34-F ELR-73-1745
Supersedes report No. EIS-IL-72-5151-D.
Prepared by Illinois State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Illinois, Environmental impact statements), Construction, Central city, Intersections, Railroads, Pollution, Eminent domain, Relocation.
Identifiers: US highway 51, Normal(Illinois), McLean County(Illinois).

The proposed project, located in the city of Normal, is the use of U.S. Route 51 and Kingsley Street as a traffic couple. The project begins at the intersection of U.S. Route 51 with Willow Street and ends at the Normal-Bloomington City Line, or Division Street. The northbound lane of the traffic couple utilizes U.S. Route 51 from the beginning of the traffic couple to the end. The southbound lane utilizes Kingsley Street on the north side of the railroad tracks. A grade separation will be constructed to carry the roadway under the Illinois Central Gulf Railroad. After the tracks have been crossed, the southbound lane follows the alignment of alleys, which parallel U.S. Route 51, until the end of the project. The total length of the proposed improvement is 1.28 miles. Both legs of the traffic couple will consist of two lanes with curb and gutter. An alternate considered for crossing the tracks was a grade separation which would carry the roadway over the Illinois Central Gulf Railroad. Other alternates have been considered. The probable impact of the project on the environment will be a minimal effect on water or air pollution. Seventeen single family residences, four mobile homes, and five commercial businesses will be displaced by the project.

EIS-IN-73-1718-D/GA PC$5.50
Army Engineer District, Louisville, Ky.
NEWBURGH BANK REVETMENT, OHIO RIVER, NEWBURGH, INDIANA.
Draft environmental impact statement.
29 Oct 73, 66p ELR-73-1718

Descriptors: (*Environmental impact statements, *Revetments), (*Indiana, Environmental impact statements), Riprap, Shore protection, Soil erosion, Ohio River.
Identifiers: Newburgh(Indiana).

A riverbank revetment has been proposed to satisfy the need for bank stabilization in the Newburgh, IN, area. This revetment procedure will include stabilizing of the bank with stone protection. The proposed project will exert impacts on the water, noise, land, and air components of the physical-chemical environment. Grading, filling, and riprapping the riverbank will result in no detectable short or long term changes in Ohio River water quality. Some short term effects will be noted in air and noise parameters. The project will be beneficial to the well-being of the town of Newburgh and its residents, especially those in the near vicinity of the erosion.

EIS-IN-73-1735-D/GA PC$6.25
Federal Aviation Administration, Washington, D.C. Airports Service.
MOUNT COMFORT AIRPORT, MOUNT COMFORT, INDIANA.
Draft environmental impact statement.
1 Nov 73, 81p ELR-73-1735
Prepared by Indianapolis Airport Authority, Indiana, and Federal Aviation Administration, Des Plaines, Ill.

Descriptors: (*Environmental impact statements, *Airports), (*Indiana, Environmental impact statements), Runways, Construction, Aircraft noise, Farm crops, Wildlife, Relocation, Taxes, Residential buildings.
Identifiers: Mount Comfort Airport, Mount Comfort(Indiana).

The proposed new airport will be located in parts of Sections 7, 8, 17 and 18, Township 16 North, Range 6 East, Hancock County. The immediate project consists of the reimbursement for land already acquired for construction of a 3200 by 60-foot runway, an aircraft parking apron, and future

airport improvements and facilities. The project also will include the necessary drainage and earth work for the future (6000-foot) primary runway and the future (3900-foot) crosswind runway. This first stage 3200-foot runway will ultimately become the taxiway for the primary runway. Environmental impacts are discussed.

EIS-KS-73-1696-F/GA PC$13.50/MF$1.45
Federal Highway Administration, Kansas City, Kans. Kansas Div.
PROPOSED IMPROVEMENT OF U.S. 54 TO FREEWAY STANDARDS WITH FULL CONTROL OF ACCESS BETWEEN 279TH STREET WEST, AND SEVILLE AVENUE, WICHITA, SEDGWICK COUNTY, KANSAS.
Final environmental impact statement.
25 Oct 73, 226p FHWA-KANS-EIS-72-19-F ELR-73-1696
Prepared by Kansas State Highway Commission. Supersedes report no. EIS-KS-72-5533-D.

Descriptors: (*Environmental impact statements, *Highways), (*Kansas, Environmental impact statements), Construction, Freeways, Limited access highways, Traffic engineering, Eminent domain.
Identifiers: US highway 54, Wichita(Kansas), Sedgwick County(Kansas).

The project proposes to improve US Highway 54 between 279th Street West and Seville Avenue in Sedgwick County, Kansas to provide a freeway facility with full control of access, interchanges, separations, and frontage roads as required. Summary of environmental impacts: additional land will be required for right-of-way; residences and businesses will be displaced; earthwork borrow requirements will be large; existing commercial businesses at Goddard may be adversely affected as a result of increased access control and/or a decrease in visual exposure; increased roadway noise levels and light intensities may adversely affect some existing residentail and commercial developments; safer, more efficient travel will be rpovided for the public; the proposed improvement should enhance the attractiveness of Goddard for future residential, commercial and industrial growth; the proposed improvement is part of the only planned freeway facility linking Southwest Kansas with Wichita and the other major metropolitan centers, in the northeast and southeast portions of the state, including the state capital; the proposed improvement will relieve congestion on West Wichita's future arterial street system and provide improved access to the Wichita Municipal Airport, Kansas' largest air terminal.

EIS-KS-73-1753-D/GA PC$4.00
Federal Highway Administration, Kansas City, Kans. Kansas Div.
PROPOSED IMPROVEMENT OF THE INTERSECTION OF 71ST STREET AND METCALF AVENUE IN THE CITY OF OVERLAND PARK, JOHNSON COUNTY, KANSAS.
Draft environmental impact statement.
5 Nov 73, 39p FHWA-KS-EIS-73-08-D ELR-73-1753
Prepared by Kansas state Highway Commission.

Descriptors: (*Environmental impact statements, *Streets), (*Kansas, Environmental impact statements), Intersections, Improvement, Traffic safety, Right of way acquisition, Trees(Plants).
Identifiers: Overland Park(Kansas).

Improvement of the intersection of 71st Street and Metcalf Avenue is proposed in the city of Overland Park, Kansas. The project will provide a safer, more efficient roadway for the public. Construction activities will cause temporary increases in air and noise pollution; land will be required for right of way; and some shade trees will have to be removed.

EIS-KY-73-1724-D/GA PC$9.50
Army Engineer District, Louisville, Ky.
CARR FORK LAKE, NORTH FORK, KENTUCKY RIVER, KENTUCKY.
Draft environmental impact statement.
30 Oct 73, 150p ELR-73-1724

Descriptors: (*Environmental impact statements, Multiple purpose reservoirs), (*Kentucky, Environmental impact statements), Flood control, Water quality, Recreational facilities, Relocation, Residential buildings, Industrial buildings, Land use, Public utilities.
Identifiers: Hazard(Kentucky).

The proposal concerns completion of construction and operation of Carr Fork Lake located approximately 16 miles east of Hazard, KY. Project purposes include flood control, water quality control, recreation, and fish and wildlife conservation. As of 1 September 1973, the project is 75% complete, with final pool clearing and recreation site construction contracted but not yet completed. Relocation of displaced persons, businesses, roads, and utilities is essentially complete; relocation of cemeteries is complete. Environmental impacts are described.

EIS-KY-73-1727-D/GA PC$7.25
Federal Highway Administration, Frankfort, Ky. Kentucky Div.
LETCHER COUNTY, KENTUCKY, APD 140 FAP 12, US 119 APPALACHIAN CORRIDOR F. PROJECT PLANNING REPORT.
Draft environmental impact statement.
31 Oct 73, 102p FHWA-KY-73-1727-D ELR-73-1727
Prepared by Kentucky State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Kentucky, Environmental impact statements), Construction, Traffic engineering, Rural areas.
Identifiers: Letcher County(Kentucky), US highway 119.

The project proposes improvement of US Highway 119 in Letcher County from the Harlan County Line to KY 15 near Ermine. US Highway 119 begins at its junction with US 25E just south of Pineville and extends generally northeast through Loyall, Cumberland, Whitesburg, Jenkins, and Pikeville and exits the state at the West Virginia Line at South Williamson. It continues northeasterly through West Virginia and ends at the junction of US Highway 229 at Du Bois, PA. Throughout Letcher County it is currently a part of the Federal-aid Primary System and is classified as State Primary on the State Responsibility System. It has a 1973 and 1990 Functional Classification of Rural Principal Arterial. Most of the project lies within the Cumberland Mountain physiographic region of Kentucky which includes Pine Mountain, Cumberland Mountain, and the intervening Middlesboro Basin. Environmental impacts and adverse effects are discussed.

EIS-KY-73-1739-D/GA PC$7.25
Federal Highway Administration, Frankfort, Ky. Kentucky Div.
GRAVES-MCCRACKEN COUNTIES, F 144 (29), SP 42-598-16L, SP 73-682-2L, MAYFIELD-PADUCAH ROAD, U.S. 45, KENTUCKY.
Draft environmental impact statement.
2 Nov 73, 101p FHWA-KY-EIS-73-12-D ELR-73-1739
Prepared by Kentucky Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Kentucky, Environmental impact statements), Construction, Right of way acquisition, Eminent domain.
Identifiers: US highway 45, Graves County(Kentucky), McCracken County(Kentucky).

It is proposed to improve US Highway 45 from near the north end of the existing four-lane U.S. Highway 45 near the General Tire and Rubber Co. at Mayfield, and extending northerly to end on the existing four-lane section of U.S. Highway 45 near the Lone Oak Baptist Church. The Highway location is such that the proposed highway can be constructed economically with partial control of access. The section is four-lane construction with a 60 ft depressed median. The new facility will provide safer, faster, more efficient transportation for national defense, intrastate, interstate and local needs. However, the project will displace four residences and one business (a service station); will cause temporary inconvenience to the through and local highway users during construction; and will cause the taking of land for right-of-way purposes.

EIS-LA-73-1704-D-1/GA PC$27.00
Bureau of Land Management, Washington, D.C.
PROPOSED 1974 OUTER CONTINENTAL SHELF OIL AND GAS GENERAL LEASE SALE, OFFSHORE LOUISIANA. VOLUME I.
Draft environmental impact statement.
29 Oct 73, 500p ELR-73-1704-D-1, DES-73-69-D-1
See also Volume 2, EIS-LA-73-1704-D-2.

Descriptors: (*Environmental impact statements, *Offshore drilling), (*Louisiana, Environmental impact statements), Leasing, Continental shelves, Crude oil, Natural gas, Water pollution, Oil storage, Oil recovery, Mexico Gulf.
Identifiers: Oil pollution.

The project proposes oil and gas lease sale, in the Outer Continental Shelf, Gulf of Mexico. 215 tracts (952,592.48 acres) of Outer Continental Shelf lands are proposed for leasing action. The tracts are located offshore Louisiana; twelve tracts (69,120 acres) are situated in water depths of 300 meters or beyond. If implemented, the sale is tentatively scheduled to be held in early spring, 1974. All tracts offered pose some degree of pollution risk to the environment and adjacent shoreline. The risk potential is related to adverse effects on the environment and other resource uses which may result principally from accidental or chronic oil spillage. Each tract offered is subjected to a matrix analytical technique in order to evaluate significant environmental impacts should leasing and subsequent oil and gas exploration and production ensue. Environmental impacts and adverse effects are discussed.

EIS-LA-73-1704-D-2/GA PC$32.50
Bureau of Land Management, Washington, D.C.
PROPOSED 1974 OUTER CONTINENTAL SHELF OIL AND GAS GENERAL LEASE SALE, OFFSHORE LOUISIANA. VOLUME II.
Draft environmental impact statement.
29 Oct 73, 607p ELR-73-1704-D-2, DES-73-69-D-2
See also Volume 1, EIS-LA-73-1704-D-1.

Descriptors: (*Environmental impact statements, *Offshore drilling), (*Louisiana, Environmental impact statements), Leasing, Continental shelves, Crude oil, Natural gas, Water pollution, Oil storage, Oil recovery, Mexico Gulf.
Identifiers: Oil pollution.

Contents: Mitigating measures included in the proposed action; Unavoidable adverse environmental effects; Relationship between local short-term use and maintenance and enhancement of long-term productivity; Irreversible and irretrievable commitment of resources; and Alternatives to the proposed action.

EIS-MA-73-1705-D/GA PC$3.75
Corps of Engineers, Waltham, Mass. New England Div.
BUTTERMILK BAY CHANNEL, TAYLOR POINT-BUZZARDS BAY, MASSACHUSETTS, SMALL NAVIGATION PROJECT.
Draft environmental impact statement.
29 Oct 73, 32p ELR-73-1705

Descriptors: (*Environmental impact statements, *Channel improvements), (*Massachusetts, Environmental impact statements), Dredging, Spoil, Water quality, Benthos, Buzzards Bay.

Improvement is proposed of a navigation project consisting of dredging a channel 100' to 60' wide, six feet deep extending from end of present Federal channel to entrance of a proposed town marina on Taylors Point, Massachusetts. Approximately 8000 cubic yards of material will be removed by bucket dredge method. It is proposed to deposit the spoil in an offshore dump area located in Buzzards Bay. The project will provide safe navigational access to a marina proposed by the town of Bourne. Some marine organisms will be destroyed in the dredge/spoil areas, particularly non-burrowing forms; water quality will temporarily suffer degradation during the work period. Recruitment and recolonization will occur in the dredge/spoil areas but more slowly at the offshore spoil site because of an overlay of new spoil materials.

EIS-MD-73-1728-D/GA PC$7.25
Federal Highway Administration, Baltimore, Md. Maryland Div.
LANSDOWNE ROAD FROM WASHINGTON BOULEVARD TO SOUTHWESTERN BOULEVARD IN BALTIMORE COUNTY, MARYLAND.
Draft environmental impact statement.
31 Oct 73, 104p FHWA-MD-EIS-73-09-D ELR-73-1728
Prepared by Baltimore County Maryland Dept. of Public Works.

Descriptors: (*Environmental impact statements, *Highways), (*Maryland, Environmental impact statements), Construction, Traffic engineering, Highway bridges, Eminent domain.
Identifiers: Baltimore County(Maryland), Lansdowne road.

The proposed project provides a six-lane 1.3 mile roadway facility in southwestern Baltimore County, Maryland. Included in the facility is a bridge providing a grade separated structure at the main line of the Penn Central Railroad. This bridge will allow for the closing of a dangerous grade crossing of the Penn Central tracks at a point where the high speed Metroliner passes. The acquisition of between 2 and 25 residences will be required depending upon alternate chosen. With proper erosion control procedures no long term adverse effect is expected on water quality, and only minimal increases in stream turbidity will exist during construction. Air and noise pollution will be well below established standards. With the diversion of traffic from local streets, some reduction in noise and air pollution will be experienced within residential areas. The elimination of the dangerous Penn Central Railroad grade crossing and the provision of much needed access to the local industrial community are direct benefits of the facility.

EIS-MI-73-1736-D/GA PC$6.00
Federal Highway Administration, Lansing, Mich. Michigan Div.
PROPOSED RECONSTRUCTION OF LOGAN STREET (M-99) FROM VICTOR STREET TO KALAMAZOO STREET, LANSING, MICHIGAN.
Draft environmental impact statement.
1 Nov 73, 77p FHWA-MICH-EIS-73-08-D ELR-73-1736
Prepared by Michigan State Dept. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*Michigan, Environmental impact statements), Construction, Central city, Traffic engineering.
Identifiers: Logan Street, Lansing(Michigan).

The proposed project is a Federal-aid Secondary route and is 1.8 miles in length. It begins at Victor Street just north of the Grand Trunk Railroad and terminates at Kalamazoo Street in the north. The proposed facility will consist of six lanes with three northbound and three southbound lanes. Specific design features will be further analyzed in Section D of this Statement. The section between the I-96 freeway and the New York Central Railroad just south of Victor Street was upgraded from two to five lanes in 1963. Logan Street is a State trunkline south of I-496. The scheduled improvement of Logan Street between Victor and Kalamazoo Streets is a part of the future plans for improvement of road facilities within the city. These improvements are eventually to be extended north of Kalamazoo Street to M-43, and then possibly to a future northbelt freeway, bypassing the northern perimeter of the Lansing urbanized area. Environmental impacts and adverse effects are discussed.

EIS-MN-73-1752-F/GA PC$5.75/MF$1.45
Federal Highway Administration, St. Paul, Minn. Minnesota Div.
U.S. 169 IN ST. LOUIS COUNTY, MINNESOTA, STATE PROJECT 6935-39, MINNESOTA PROJECT F 076-2(), FROM WEST LIMITS OF CITY OF CHISHOLM, TO COUNTY STATE AID HIGHWAY 25 NEAR THE VILLAGE OF KINNEY.
Final environmental impact statement.
5 Nov 73, 71p FHWA-MN-EIS-72-12-F ELR-73-1752
Supersedes report No. EIS-MN-72-5540-D.
Prepared by Minnesota State Dept. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*Minnesota, Environmental impact statements), Construction, Bypasses, Eminent domain, Relocation.
Identifiers: US highway 169, Saint Louis County(Minnesota).

The project provides for the relocation of an 8.5 mile section of U.S. Highway 169 between the city of Chisholm and the village of Kinney. The proposed relocated section of U.S. Highway 169 will by-pass the city of Chisholm and the villages of Fraser, Buhl and Kinney. The new facility will improve the transportation quality as to safety, capacity and travel time, and will reduce congestion, noise and air pollution in Chisholm, Buhl and Kinney. However, five homes and two businesses will have to be relocated.

EIS-MO-73-1674-D/GA PC$6.75
Environmental Protection Agency, Kansas City, Mo. Region VII.
PROPOSED WASTE TREATMENT FACILITIES PREPARED IN REGARD TO PROJECT C290524. CONSTRUCTION OF TRANSPORTATION AND WASTE TREATMENT FACILITIES FOR MONETT, MISSOURI.
Draft environmental impact statement.
23 Oct 73, 91p ELR-73-1674

Descriptors: (*Environmental impact statements, *Waste treatment), (*Missouri, Environmental impact statements), Waste water, Facilities, Construction, Municipalities, Aeration, Lagoons(Ponds), Land acquisition, Esthetics, Odors.
Identifiers: Sewage treatment plants, Monett(Missouri).

The city of Monett proposes to construct additional wastewater treatment facilities along with various interceptors, lift stations and force mains to serve areas throughout the city. The expansions proposed to the existing plant are an extended aeration process with clarifiers and polishing lagoons. The proposed expansion would increase the capacity of the existing facilities to accomodate a population equivalent of approximately 53,000. The expansion of the existing facilities will use additional land already zoned for industrial. The facilities may also have some adverse aesthetic affects due to its proximity to a partially developed residential and commercial area. Secondary waste treatment as defined will meet the Missouri Water Quality Standards. The expansion will create a larger treatment facility at the site. It may produce additional odor problems due to increased amounts of sewage being treated. This could be most undesirable due to its proximity to a developed area.

EIS-MS-73-1706-D/GA PC$4.75
Soil Conservation Service, Jackson, Miss.
TILLATOBA CREEK WATERSHED, YALOBUSHA, TALLAHATCHIE, AND GRENADA COUNTIES, MISSISSIPPI.
Draft environmental impact statement.
29 Oct 73, 51p USDA-SCS-ES-WS(Adm)-74-18-D ELR-73-1706

Descriptors: (*Environmental impact statements, *Multiple purpose reservoirs), (*Mississippi, Environmental impact statements), Flood control, Erosion, Channel improvements, Water quality, Wildlife, Land use.
Identifiers: Yalobusha County(Mississippi), Tallahatchie County(Mississippi), Grenada County(Mississippi).

A flood prevention project is proposed for the 69,936 acres (109.3 square miles) of the Tillatoba Creek Watershed in Yalobusha, Tallahatchie, and Grenada Counties, MS. Land treatment measures will be applied to reduce erosion and reduce sedimentation. Twelve dams will be built to provide flood protection. Four grade control structures will be built to control the grade of Tillatoba Creek and the South Fork of Tillatoba Creek. Channel work will be done on 9.87 mile to increase its carrying capacity. Environmental impacts are described.

EIS-MS-73-1716-F/GA PC$6.25/MF$1.45
Soil Conservation Service, Washington, D.C.
SOWASHEE CREEK WATERSHED, LAUDERDALE COUNTY, MISSISSIPPI.
Final environmental impact statement.
29 Oct 73, 84p USDA-SCS-ES-WS(Adm)-73-1-F ELR-73-1716
Supersedes report No. EIS-MS-73-0541-D.

Descriptors: (*Environmental impact statements, *Multiple purpose reservoirs), (*Mississippi, Environmental impact statements), Flood control, Land use, Recreational facilities, Farms, Wildlife, Channel improvements, Fishes.
Identifiers: Lauderdale County(Mississippi).

Plans are presented for solving water and natural resource problems (erosion, sedimentation, flooding, low income, and inadequate recreation facilities) through utilization of conservation land treatment measures, single-purpose floodwater retarding structures, multiple-purpose structure for floodwater retardation and recreation, basic recreation facilities, and channel modifications in the Sowashee Creek Watershed, located in Lauderdale County and Meridian, MS. Environmental effects included are: flood and erosion control; urban and agricultural land use; an increase in recreational facilities; and increase income of farm operators and urban flood plain users.

EIS-MS-73-1749-F/GA PC$4.00/MF$1.45
Army Engineer District, Mobile, Ala.
TOMBIGBEE RIVER (EAST FORK), ITAWAMBA COUNTY, MISSISSIPPI. OPERATION AND MAINTENANCE.
Final environmental impact statement.
5 Nov 73, 38p ELR-73-1749
Supersedes report No. EIS-NS-73-0781-D.

Descriptors: (*Environmental impact statements, *Channel improvements), (*Mississippi, Environmental impact statements), Tombigbee River, Flood control, Removal, Maintenance, Benthos, Turbidity.
Identifiers: Itawamba County(Mississippi).

Continued operation and maintenance of the existing flood control project on the Tombigbee River in Itawamba County, MS, is proposed. The maintenance work consists of the removal of snags and drift jams that obstruct flow and disposal of the debris. Environmental impacts include alleviation of flood conditions, improved usability of the river by small boats and increased turbidity during construction operations. Adverse environmental effects include increased turbidity associated with construction activities, and reduction of available habitat for aquatic invertebrates and algae.

EIS-MT-73-1733-F/GA PC$7.75/MF$1.45
Kootenai National Forest, Libby, Mont.
MULTIPLE USE PLAN, EAST FORK YAAK PLANNING UNIT, MONTANA.
Final environmental impact statement.
31 Oct 73, 113p ELR-73-1733, USDA-FS-FES(Adm)-73-54
Supersedes report No. EIS-MT-73-0563-D.

Descriptors: (*Environmental impact studies, *National parks), (*Montana, Environmental impact studies), Forest land, Management, Recreation, Esthetics, Kootenai National Forest.

The proposed management plan for the East Fork Yaak Planning Unit is a product of the technical analysis of the planning unit and the recognition of public expression regarding the relationship of the cultural, social, economic environmental aspects of the unit. This management plan for the Kootenai National Forest makes a significant contribution in all three areas of the national multi-objectives: Enhancement of the quality of the environment; enhancement of national economic development; and enhancement of regional development. Environmental impacts are discussed.

EIS-NB-73-1732-D/GA PC$5.00
Federal Highway Administration, Lincoln, Nebr. Nebraska Div.
PROJECT F-28(11), OMAHA-NEBRASKA CITY EXPRESSWAY, DOUGLAS, SARPY, CASS AND OTOE COUNTIES, NEBRASKA.
Draft environmental impact statement.
31 Oct 73, 58p FHWA-NEB-EIS-73-11-D ELR-73-1732
Prepared by Nebraska State Dept. of Roads.

Descriptors: (*Environmental impact statements, *Highways), (*Nebraska, Environmental impact statements), Limited access highways, Improvement, Right of way acquisition, Relocation, Residential buildings, Farms, Wildlife.
Identifiers: Otoe County(Nebraska), Cass County(Nebraska), Sarpy County(Nebraska), Douglas County(Nebraska).

The primary objective of the proposed improvement is to provide an expressway type facility which will reasonably meet the service requirements within a band of interest located in portions of Otoe, Cass, Sarpy and Douglas Counties, NB. The interest area begins about 8 miles south of Nebraska City and proceeds northerly about 46 miles, generally paralleling existing U.S. 73-75, to the vicinity of the intersection of 'W' Street and Railroad Avenue in Omaha. Environmental effects are described.

EIS-NB-73-1740-D/GA PC$3.75
Federal Highway Administration, Lincoln, Nebr. Nebraska Div.
PROJECT F-55(22), AND PROJECT F-134(7), NEBRASKA HIGHWAY NO. 15 AND U.S. HIGHWAY NO. 6, BETWEEN DORCHESTER AND MILFORD SALINE AND SEWARD COUNTIES, NEBRASKA.
Draft environmental impact statement.
5 Nov 73, 33p FHWA-NEB-EIS-73-13-D ELR-73-1740
Prepared by Nebraska State Dept. of Roads.

Descriptors: (*Environmental impact statements, *Highways), (*Nebraska, Environmental impact statements), Construction, Traffic engineering, Eminent domain, Public utilities, Right of way acquisition.
Identifiers: U.S. highway 6, Nebraska route 15, Dorchester(Nebraska), Milford(Nebraska), Saline County (Nebraska), Seward County(Nebraska).

The improvement involves the reconstruction of approximately 8.8 miles of US Highway 6 and N-15. Acquisition of new right of way will be required to flatten the curve west of Milford. Additional right of way will be required to improve the cross-section of the road and the width of the bridges to the modern standards. Some relocation impacts on local wildlife are unavoidable; these effects are believed to be minimal and most will be temporary. Some water pollution during construction is unavoidable. Private and public utilities may be in conflict with this improvement; however, during construction these variances and conflicts will be rectified. There is one tract of land owned by the Nebraska Game and Parks Commission upon which the right of way will encroach. This is classified as Section 4(f) land. Special consideration will be given to stream crossings to insure minimum disruption to riparian habitat and riverine ecosystem.

EIS-NB-73-1746-D/GA PC$3.50
Federal Highway Administration, Lincoln, Nebr. Nebraska Div.
PROJECT U-UG-278(16), HIGHWAY IMPROVEMENT ON U.S. 30 BETWEEN 8TH AND 21ST STREETS, AND WIDENING EXISTING VIADUCT OVER THE UNION PACIFIC RAILROAD TRACKS IN COLUMBUS, PLATTE COUNTY, NEBRASKA.
Draft environmental impact statement.
5 Nov 73, 28p FHWA-NEB-EIS-73-12-D ELR-73-1746
Prepared by Nebraska State Dept. of Roads.

Descriptors: (*Environmental impact statements, *Highways), (*Nebraska, Environmental impact statements), Construction, Central city, Railroads, Intersections, Eminent domain, Relocation.
Identifiers: US highway 30, Columbus(Nebraska), Platte County(Nebraska).

The proposed improvement represents approximately 0.9 mile of highway construction along US Highway 30 between 8th and 21st Streets in the City of Columbus. The improvement includes widening the existing viaduct over the Union Pacific Railroad tracks. The proposed improvement will require relocation of two service stations and three frame garages. In addition, the proposed improvement of the railroad viaduct may require the acquisition of three houses. The proposed improvement will require the adjustment of utilities. The increase in traffic resulting from the proposed improvement may create an increase in both air and noise pollution levels from that which exists at present.

EIS-NC-73-1703-D/GA PC$3.00
Army Engineer District, Charleston, S.C.
REDDIES RIVER LAKE, WILKES COUNTY, NORTH CAROLINA.
Draft environmental impact statement.
25 Oct 73, 18p ELR-73-1703

Descriptors: (*Environmental impact statements, *Multiple purpose reservoir), (*North Carolina, Environmental impact statements), Flood control, Water supply, Recreation, Wildlife, Land use, Reddies River.
Identifiers: Wilkes County(North Carolina).

The proposal is for construction of a multiple-purpose reservoir on Reddies River. The proposed reservoir will have a conservation pool of 680 acres and a flood control pool of 1330 acres. The project purposes include flood control, water supply, and recreation. Environmental impacts are to reduce downstream flooding and damages, provide a new source of municipal water, increase out-door recreation opportunities; and improve water quality by the retention of sediment within the reservoir. The project will require the transfer of 3890 acres from private to public ownership. Direct changes in land use include the permanent inundation of 680 acres of land and 8.5 miles of Reddies River by the conservation pool, temporary inundation of an additional 650 acres of land and 2.9 miles of Reddies River by the flood control pool, 1,000 acres for recreational development, and 275 acres for wildlife management.

EIS-NH-73-1702-D/GA PC$3.00
Corps of Engineers, Waltham, Mass. New England Div.
LANCASTER DAM AND LAKE, ISRAEL RIVER, LANCASTER, NEW HAMPSHIRE.
Draft environmental impact statement.
25 Oct 73, 20p ELR-73-1702

Descriptors: (*Environmental impact statements, *Multiple purpose reservoirs), (*New Hampshire, Environmental impact statements), Flood control, Ice prevention, Recreation, Land use, Israel River, Fishes.
Identifiers: Coos County(New Hampshire).

The proposal calls for the construction of a concrete ice retention and flood control structure and a 56-acre lake on the Israel River in the town of Lancaster, Coos County, New Hampshire. Recreation would be a secondary use of the reservoir. The project will prevent ice-induced flooding in Lancaster. The reservoir will be available for swimming and fishing. Adverse environmental effects are the destruction of about one and three quarters miles of trout stream. A commitment of 56 acres of farm-land for the reservoir, and additional land for project structures and uses has been made.

EIS-NH-73-1748-D/GA PC$7.50
Federal Highway Administration, Concord, N.H. New Hampshire Div.
U.S. ROUTE 4, 202 AND N.H. 9 NEW HAMPSHIRE, MERRIMACK COUNTY, CONCORD, NEW HAMPSHIRE.
Draft environmental impact statement.
5 Nov 73, 109p FHWA-NH-EIS-73-01-D ELR-73-1748
Prepared by New Hampshire State Dept. of Public Roads and Highways.

Descriptors: (*Environmental impact statements, *Highways), (*New Hampshire, Environmental impact statements), Traffic engineering, Traffic safety, Land acquisition, Relocation, Residential buildings, Commercial buildings, Engine noise, Air pollution.
Identifiers: US highway 4, US highway 202, New Hampshire route 9, Merrimack County(New Hampshire).

The proposal concerns the construction and relocation of U.S. route 4, 202, and New Hampshire route 9 in order to relieve traffic congestion. The project will include two lanes approximately 3.3 miles, and is located in Merrimack County, N.H. Environment effects are: Improved traffic engineering; highway safety; reduction in noise and air pollution, land acquisition; and relocation of four residences and one business.

EIS-NJ-73-1747-D/GA PC$16.75
Federal Highway Administration, Trenton, NJ. New Jersey Div.
ROUTE 78 IN SPRINGFIELD, MOUNTAINSIDE, SUMMIT, AND BERKELEY HEIGHTS, UNION COUNTY, NEW JERSEY.
Draft environmental impact statement.
5 Nov 73, 292p FHWA-NJ-EIS-73-01-D ELR-73-1747
Prepared by New Jersey State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*New Jersey, Environmental impact statements), (*Interstate highway systems, Environmental impact statements), Interchanges, Ramps, Interstate transportation, Land acquisition, Eminent domain.
Identifiers: Interstate highway 78, Union County(New Jersey).

The project involves the construction of a six-lane highway with interchange ramps and extends five miles between the previously constructed termini in Berkeley Heights and Springfield. The entire project is within Union County. The sections, 4N and 5P and 5N, comprise one of the remaining links in Interstate Route 78 which extends from New York City to the vicinity of Harrisburg, Pennsylvania. Its completion is necessary for both regional and local transportation needs. Route 78 will serve to divert through traffic movements from existing Route 22 thereby relieving its present congestion. The traffic which will be diverted from existing roads, including the highly congested Route 22, will experience significantly safer conditions. All the homes required for the right-of-way have been acquired. Increases in air pollution levels near the highway right-of-way are anticipated for the Watchung Reservation, John E. Runnells Hospital, the Regional High School, and the abutting residential areas. Noise levels will be higher for most areas, ranging from minor to severe impact. Lands presently used for park purposes in the Watchung Reservation will be taken.

EIS-OK-73-1750-F/GA PC$6.25/MF$1.45
Army Engineer District, Tulsa, Okla.
OPERATION AND MAINTENANCE PROGRAM, WISTER LAKE, POTEAU RIVER, OKLAHOMA.
Final environmental impact statement.
5 Nov 73, 82p ELR-73-1750
Supersedes report No. EIS-OK-73-0304-D.

Descriptors: (*Environmental impact statements, *Multiple purpose reservoirs), (*Oklahoma, Environmental impact statements), Maintenance, Flood control, Erosion control, Recreation, Waste disposal, Vegetation, Wister Lake, Poteau River.

The operation and maintenance activities at Wister Lake consists of reservoir regulation (for flood control, pollution abatement, etc); tree and grass planting; cooperative wildlife management; enforcement of regulations in Chapter 3, Title 36, Code of Federal Regulations; administration and management of agriculture and grazing leases; inspection of general leases and outgrants; pollution control; erosion control; recreation management which includes disposal of solid waste and sewage, control of undesirable vegetation (mowing, chemical control, etc), maintenance of recreation areas (planting, repairing damaged facilities, landscaping, etc), insect control, and maintenance of project structures, equipment, and buildings. Environmental impacts are described.

EIS-PA-73-1685-F/GA PC$7.25/MF$1.45
Department of Housing and Urban Development, Scranton, Pa. Scranton Special Recovery Office.
MILTON SOUTH, MILTON NORTH AND TURBOT TOWNSHIP DISASTER, URBAN RENEWAL PROJECTS, PENNSYLVANIA.
Final environmental impact statement.
24 Oct 73, 101p HUD-R03-EIS-73 19(F) ELR-73-1685
Supersedes report No. EIS-PA-73-1084-D

Descriptors: (*Environmental impact statements, *Urban renewal), (*Pennsylvania, Environmental impact statements), Construction, Rehabilitation, Disasters, Hurricanes, Urban development.
Identifiers: Milton(Pennsylvania), Turbot(Pennsylvania), Northcumberland County(Pennsylvania).

The activities proposed in the three projects include all facets of urban renewal: acquisition, demolition, clearance, redevelopment, rehabilitation, restoration, renovation, citizen participation and community development. The three project areas vary somewhat in the activities proposed. For instance all residential structures will be removed in the Turbot township area and the proposed uses are more compatible with floodplain restrictions. The North Milton project proposes primarily rehabilitation of existing structures in accordance with the requirements of the flood ordinance. The project in South Milton proposes the removal of disaster affected residential premises with a proposed reuse of minimum residential and an expanded industrial complex with additional parking areas and recreational activities. All of the projects and reuses are considered as reasonable accommodations between the hazards of reconstruction in flood prone areas and complete abandonment of the flood stricken community. They provide the most essential improvement on a cost benefit basis. The abandonment of the flooded areas and complete community relocation is not economically feasible and the cost would be prohibitive. Environmental impacts and adverse environmental effects are discussed.

EIS-PA-73-1686-F/GA PC$6.75/MF$1.45
Department of Housing and Urban Development, Scranton, Pa. Scranton Special Recovery Office.
MODEL CITIES ONE URBAN RENEWAL PROJECT, READING, PENNSYLVANIA.
Final environmental impact statement.
24 Oct 73, 95p HUD-R03-EIS-73-18(F) ELR-73-1686
Supersedes report No. EIS-PA-73-1082-D.

Descriptors: (*Environmental impact statements, *Urban renewal), (*Pennsylvania, Environmental impact statements), Buildings, Blighted areas, Construction, Building codes, Streets, Sewers, Urbban development.
Identifiers: Reading(Pennsylvania), Berks County(Pennsylvania).

The project area is located in the city of Reading, Berks County, Pennsylvania. Activities in the 56.73 acre project area will include the acquisition of structures to remove substandard and blighting influences and to achieve sound planning objectives, the demolition of such structures, the provision of relocation assistance and benefits, the rehabilitation of not-to-be-acquired structures to meet nationally recognized code standards, the facilitation of new residential, commercial and industrial development, and the upgrading of existing street and sewer systems. The overall impact of the project is beneficial. Most adverse environmental effects of the environment on the project are associated with the area's vulnerability to flooding. However, these adverse effects are mitigated to a large degree.

EIS-PA-73-1697-F/GA PC$15.00/MF$1.45
Federal Highway Administration, Harrisburg, Pa. Pennsylvania Div.
CONSTRUCTION OF LEGISLATIVE ROUTE 1003, SECTION 3 (INTERSTATE 79), FROM THE 26TH STREET INTERCHANGE, TO THE 12TH STREET INTERCHANGE IN ERIE CITY AND MILLCREEK TOWNSHIP, ERIE COUNTY, PENNSYLVANIA.
Final environmental impact statement.
25 Oct 73, 256p FHWA-PA-EIS-72-08-F ELR-73-1697
Supersedes report No. EIS-PA-72-5038-D. Prepared by Pennsylvania State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Pennsylvania, Environmental impact statements), (*Interstate highway system, Environmental impact statements), Construction, Central city, Interchanges, Traffic engineering, Eminent domain.
Identifiers: Interstate highway 79, Erie(Pennsylvania), Erie County(Pennsylvania).

The proposed facility is the northernmost section of Interstate 79 and it terminates with an interchange at 12th Street in the city of Erie. The mainline grading begins approximately 300 feet south of existing 21st Street and terminates with a ramp extending approximately 550 feet north of existing 12th Street having an overall project length of approximately 0.8 miles. The reconstruction of 12th Street begins approximately 350 feet west of Pittsburgh Avenue and terminates approximately 500 feet east of Greengarden Road. The proposed facility will provide fast, safe and efficient transportation. The proposed facility may produce some detrimental effects on those families to be relocated by changing their environment and making adjustment necessary. The project will indirectly affect Woodland Park by establishing an alignment for the Bayfront Expressway which will encroach on the park when it is constructed. However proper design and construction procedure can insure very little damage to Woodland Park.

EIS-PA-73-1751-F/GA PC$6.75/MF$1.45
Department of Housing and Urban Development, Scranton, Pa. Scranton Special Recovery Office.
DOWNTOWN URBAN RENEWAL PROJECT, WILKES-BARRE, PENNSYLVANIA.
Final environmental impact statement.
5 Nov 73, 92p HUD-R03-EIS-73-16(F) ELR-73-1751
Supersedes report No. EIS-PA-73-1086-D. Prepared by Redevelopment Authority of the City of Wilkes-Barre, Pa.

Descriptors: (*Environmental impact statements, *Urban renewal), (*Pennsylvania, Environmental impact statements), Floods, Improvement, Commercial buildings, Esthetics, Water quality, Traffic engineering, Construction, Storms, Public utilities, Residential buildings.
Identifiers: Disaster areas, Wilkes-Barre(Pennsylvania).

The proposed downtown urban renewal project is in the presidentially proclaimed major disaster area resulting from tropical storm Agnes in June 1972. The project site of 207.73 acres, is the commercial center or downtown area of Wilkes-Barre. This area will be rebuilt by (1) removing flood damaged and structually substandard structures, (2) restoring and improving public facilities, (3) improve traffic circulation, (4) improving and beautifying open space and parks (5) providing better pedestrian movement and amenities, (6) strengthening residential uses in the northeast corner of the project and (7) anchoring commercial development in the downtown area. Environmental effects are described.

EIS-RI-73-1767-D/GA PC$7.25
Federal Power Commission, Washington, D.C. Bureau of Natural Gas.
CONSTRUCTION AND OPERATION OF AN LNG IMPORT TERMINAL AT PROVIDENCE, RHODE ISLAND. EASCOGAS LNG, INC., ALGONQUIN LNG, INC., ALGONQUIN GAS TRANSMISSION COMPANY, AND NEW ENGLAND LNG, INC. DOCKET NOS. CP73-47, CP73-8 8, CP73-139, CP73-197, CP73-199.
Draft environmental impact statement.
8 Nov 73, 349p* ELR-73-1767

Descriptors: (*Environmental impact statements, *Rhode Island), (*Liguefied natural gas, *Marine terminals), Urban planning, Land use, Land surveys, Socioeconomic status, Gas pipelines, Storage tanks, Gas storage, Gas industry.
Identifiers: Providence(Rhode Island).

The report discusses a proposal for the construction of facilities required to unload, store, revaporize and distribute liquefied natural gas. The facilities would include the construction of an unloading dock, storage tanks, pipeline crossings, a metering station, and other appurtenant facilities.

EIS-SD-73-1717-F/GA PC$4.25/MF$1.45
Soil Conservation Service, Huron, S. Dak.
SILVER CREEK WATERSHED, MINNEHAHA COUNTY, SOUTH DAKOTA.
Final environmental impact statement.
29 Oct 73, 41p USDA-SCS-ES-WS(Adm)-73-44-F ELR-73-1717
Supersedes report No. EIS-SD-73-0144-D.

Descriptors: (*Environmental impact studies, *Multiple purpose reservoirs), (*South Dakota, Environmental impact statements), Flood control, Channel improvements, Soil erosion, Vegetation, Trees(Plants).
Identifiers: Minnehaha County(South Dakota).

A proposal is presented for completion of a project for watershed protection and flood prevention in Minnehaha County, SD. Land treatment on the remaining 5410 acres will reduce soil erosion by 27,000 tons per year. The sediment leaving the watershed or entering the flood water retarding structures will be reduced 2700 tons per year. The completion of the 14 miles of channel work, two miles of snagging, and one mile of new channel from structures five and six will reduce floodwater damages on 4200 acres by carrying the release from the six floodwater retarding structures and removing the runoff from a 20% chance storm in 24 hours, increase herbaceous cover by 25 acres, and increase woody cover by four acres. Adverse effects are increase of noise level and air pollution by dust during construction, temporary loss of ten acres of woody habitat, and temporary loss of 69 acres of herbaceous cover.

EIS-TN-73-1701-F/GA PC$5.00/MF$1.45
Soil Conservation Service, Washington, D.C.
RED BOILING SPRINGS WATERSHED PROJECT, MACON AND CLAY COUNTIES, TENNESSEE.
Final environmental impact statement.
25 Oct 73, 58p USDA-SCS-ES-WS(Adm)-73-21-F ELR-73-1701
Supersedes report No. EIS-TN-73-0034-D.

Descriptors: (*Environmental impact statements, *Dams), (*Tennessee, Environmental impact statements), Flood control, Spillways, Land use, Wildlife, Farms, Forest land.
Identifiers: Red Bolling Springs Watershed project, Macon County(Tennessee), Clay County(Tennessee).

The project is located in Macon and Clay Counties, Tennessee, and proposes conservation land treatment measures on 2450 acres and five floodwater retarding structures for flood control with measures to preserve the downstream fishery habitat. Zoning will be carried out to insure proper land use in the flood plain. Environmental effects are that the land treatment and structural measures will reduce flood damage to crop and pastureland by about 49%, other agricultural damages by 59%, road and bridge damages by 93%, urban property damages in Red Boiling Springs by 97%, overbank deposition of sediment 60%, and flood plain scour 70%. Homes, commercial and public properties in the flood plain of Salt Lick Creek and Haney Branch will be protected from a 100-year frequency flood. About 160 new jobs will be created as a result of the project. Wildlife habitat on 11 acres of cropland, 20 acres of grassland, and 24 acres of forest land will be inundated by water that will have some fishery value. About 1.8 miles of stream channels with low fishery value will be inundated. There will be temporary flooding on 78 acres, which includes 15 acres cropland, 24 acres grassland and 39 acres forest land. About 107 acres will be needed in the construction areas for dams, spillways and borrow areas and includes 12 acres of cropland, 48 acres of grassland and 47 acres of forest land.

EIS-TX-73-1730-F/GA PC$5.75/MF$1.45
International Boundary and Water Commission, El Paso, Tex. Planning and Reports Branch.
INCREASING HEIGHT OF LEVEES ALONG RIO GRANDE UPSTREAM FROM RETAMAL DAM AND ALONG MAIN AND NORTH FLOODWAYS. LOWER RIO GRANDE FLOOD CONTROL PROJECT, TEXAS.
Final environmental impact statement.
31 Oct 73, 74p IBWC-PRB-EIS-73-1 ELR-73-1730
Supersedes report No. EIS-TX-73-0990-D.

Descriptors: (*Environmental impact statements, *Levees), (*Texas, Environmental impact statements), Flood control, Construction, Rio Grande River, Right of way acquisition.
Identifiers: Hidalgo County(Texas), Cameron County(Texas), Willacy County(Texas).

Construction by the United States is proposed for increasing the height of levees along Rio Grande at locations upstream from Retamal Dam, and along Main and North Floodways, in Hidalgo, Cameron and Willacy Counties, Texas. The proposed levee raises are part of a modification to the existing United States portion of the international flood control system to provide a greater degree of protection to United States lands and to assure diversion of the United States one-half share of excess Rio Grande floodwaters, in accordance with an international agreement with Mexico. Increasing levee heights will require commitment of 112 acres of existing rights-of-way for the levees. Lands for borrow sources total 452 acres and include 152 acres for increasing the width of the North Floodway pilot channel, 210 acres of existing borrow sources, and 81 acres of new borrow sources. Borrow areas will remove 111 acres from cultivation, and change 42 acres of brushland to grassland. There is expected minor temporary interference with transportation during construction, and negligible temporary effect on fishery from turbidity following rains during the construction period.

EIS-TX-73-1737-D/GA PC$4.25
Federal Highway Administration, Austin, Tex. Texas Div.
U.S. HIGHWAYS 59 AND 96, FROM SHELBY-PANOLA COUNTY LINE TO 4.8 MILES SOUTH OF TENAHA, SHELBY COUNTY.
Draft environmental impact statement.
1 Nov 73, 45p FHWA-TEX-EIS-73-14-D ELR-73-1737
Prepared by Texas State Highway Dept.

Descriptors: (*Environmental impact statements, *Highways), (*Texas, Environmental impact statements), Construction, Divided highways, Eminen domain, Relocation.
Identifiers: US highway 59, US highway 96, Tenaha(Texas), Shelby County(Texas).

The project proposes construction of a four-lane divided highway (Not controlled access). The new project will alleviate traffic congestion, savings in time, dispersion of noise in the city of Tenaha. The project will cause relocation of fifteen residencies, two stores, one beauty shop, one service station, one welding shop, and one cafe.

EIS-TX-73-1795-F/GA PC$5.50/MF$1.45
National Park Service, Santa Fe, N. Mex. Southwest Region.
PROPOSED DIABLO EAST DEVELOPMENT SITE, AMISTAD RECREATION AREA, TEXAS.
Final environmental impact statement.
14 Nov 73, 70p ELR-73-1795, FES-73-64
Supersedes report No. EIS-TX-73-0955-D.

Descriptors: (*Environmental impact statements, *Recreational facilities), (*Texas, Environmental impact statements), Social welfare, Improvement, Multiple purpose reservoirs, Construction, National parks.
Identifiers: Outdoor recreation, Val Verde County(Texas).

Development is proposed of a high density recreation site consisting of 586 acres at Amistad Recreation Area, Val Verde County, Texas, to serve water recreation needs in a large region almost totally devoid of public outdoor recreation opportunities. The major portion of the environmental impact from the proposal will be increased human impact under controlled circumstances with decrease in human impact on the natural environment of adjacent areas. Construction will produce some temporary adverse environmental effects.

EIS-VA-73-1699-F/GA PC$8.75/MF$1.45
Army Engineer District, Norfolk, Va.
WATER INTAKE AND PUMP STATION OF CITY OF CHESAPEAKE, VA. (NORTHWEST RIVER).
Final environmental impact statement.
25 Oct 73, 132p ELR-73-1699
Supersedes report No. EIS-VA-72-5772-D.

Descriptors: (*Environmental impact statements, *Pumping stations), (*Virginia, Environmental impact statements), Water intakes, Benthos, Water supply, Public health, Estuaries.
Identifiers: Chesapeake(Virginia).

The proposal describes construction of a water intake and pump station on the north bank of the Northwest River in the city of Chesapeake, Virginia for the purpose of direct water-withdrawal from the river. The proposed project will affect interstate waters of Virginia and North Carolina. Impacts will include denudation of one acre of scenic lowland, preclude usage of project area by native fauna, minor destruction of benthic organisms, removal of part of the total freshwater input into an estuarine complex, relief of local public health problems, and reduce the cost of local public water supply. Adverse effects include the denudation of one acre of scenic lowland, minor destruction of benthic organisms, preclude usage of project area by native fauna, and removal of part of the total freshwater input into an estuarine complex.

EIS-VT-73-1708-F/GA PC$4.75/MF$1.45
Soil Conservation Service, Washington, D.C.
UPPER CASTLETON RIVER WATERSHED PROJECT, RUTLAND COUNTY, VERMONT.
Final environmental impact statement.
29 Oct 73, 53p USDA-SCS-ES-WS(Adm)-73-23-F ELR-73-1708
Supersedes report No. EIS-VT-72-5461-D.

Descriptors: (*Environmental impact statements, *Multiple purpose reservoirs), (*Vermont, Environmental impact statements), Flood control, Channel improvements, Wildlife, Turbioity, Erosion, Fisheries.
Identifiers: Rutland County(Vermont).

The proposed Upper Castleton River Watershed Project is located in Rutland County, VT. The project is for flood prevention and fish and wildlife development, and requires installation of a multiple-purpose dam with fish and wildlife development, channel work, and other associated improvements for purposes of fish and wildlife management. The project will reduce flooding, sedimentation and erosion. It will allow better drainage of water from agricultural and residential areas. Opportunities for rural development will be enhanced, and the general economy will be improved. Wildlife habitat will be improved with the development of a 50-acre cold water lake fishery, a 100-acre waterfowl marsh and a 125-acre area to be purchased for and dedicated to upland wildlife habitat. However, existing upland wildlife habitat will be lost in the open water area of the impoundment at Whipple Hollow site. Construction activity will cause temporary increases in turbidity, sedimentation and noise levels at construction sites. About 3,200 feet of stream fishery will be lost at Whipple Hollow site and two miles of stream will be temporarily affected by channel work. About 30 acres of woodland will be taken for the lake.

EIS-WA-73-1682-F/GA PC$10.75/MF$1.45
Federal Highway Administration, Olympia, Wash. Washington Div.
WEST SNOQUALMIE TO TANNER, KING COUNTY, WASHINGTON.
Final environmental impact statement.
24 Oct 73, 172p FHWA-WN-EIS-72-08-F ELR-73-1682
Supersedes report No. EIS-WA-72-5213-D.
Prepared by Washington State Dept. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*Washington(State), Environmental impact statements), Limited access highways, Traffic engineering, Wildlife, Forest land.
Identifiers: Washington route 90, King County(Washington).

The improvement consists of the reconstruction of approximately 7 miles of SR 90 to six lanes, with fully controlled limited access, from a point 0.95 mile east of SR 18 at Echo Lake Interchange to the overcrossing of the Chicago, Milwaukee, St. Paul and Pacific Railroad (Milwaukee Road) at Tanner. This section of SR 90 located in King County, is a major transcontinental route and is the only cross-mountain interstate highway linking Washington's major population centers. The project will provide a smoother and safer traffic flow, relieving the town of North Bend of the severe traffic congestion that now plagues the community, and providing the motorist with a more efficient transportation system based on the standards for interstate highway design. Other unavoidable adverse effects of the project are the modifying of game migration trails, some damage to life systems, some degradation of water quality, the visual detraction of use of forests and open countryside, the displacement of families, and the use of potential residential areas. In recognition of the adverse effects caused by the implementation of the project, every effort will be made to relieve or minimize them.

EIS-WA-73-1711-D/GA PC$9.00
National Park Service, Seattle, Wash. Pacific Northwest Region.
PROPOSED MASTER PLAN, MOUNT RAINIER NATIONAL PARK, WASHINGTON.
Draft environmental impact statement.
29 Oct 73, 140p ELR-73-1711, DES-73-64

Descriptors: (*Environmental impact statements, *National parks), (*Washington(State), Environmental impact statements), Recreational facilities, Esthetics, Pollution, Management, Vegetation, Resources.
Identifiers: Mount Rainier National Park.

The National Park Service proposes a conceptual master plan for Mount Rainier National Park to establish development patterns and provide management guidelines. Benefits will accrue to both the natural environment and the visitors' experiences by designing, relocating, and rehabilitating facilities to accommodate increased visitor use with the least possible effect on the natural environment; by relocating outside the park those administrative and operational facilities not essential to the prime resource values within the park; and by introducing a form of public transportation within the park. Some of the adverse effects include visitor use impacts such as littering, trampling of vegetation, and compaction of soil; utilization of park lands for roads and visitor use facilities; noise and pollution; and short-term effects of construction and rehabilitation activities.

EIS-WA-73-1713-D-1/GA PC$10.25
Federal Highway Administration, Olympia, Wash. Washington Div.
SR 90, EASTGATE VICINITY, KING COUNTY, WASHINGTON. VOLUME I.
Draft environmental impact statement.
29 Oct 73, 161p FHWA-WN-EIS-73-12-D ELR-73-1713-D-1
Prepared by Washington State Dept. of Highways.
See also Volume 2, WIS-WA-73-1713-D-2.

Descriptors: (*Environmental impact statements, *Highways), (*Washington(State), Environmental impact statements), Construction, Central city, Limited access highways, Eminent domain, Relocation.
Identifiers: Washington route 90, King County(Washington), Bellevue(Washington).

The project proposes reconstruction of SR 90 to eight lanes with fully controlled limited acess from Station LR Sta. 450+00.00 P.O.T. (east of Henry Richards Road) to Station 569+50.00 P.O.T. (west of SR 901 Interchange), a distance of 2.25 miles in the City of Bellevue, King County, Washington. This new section will replace the existing four lane partially controlled limited access Highway on the same alignment with a major interchange at Eastgate, a grade separation at 136th Place S.E., and a minor interchange at Vasa Park Road. Construction of the SR 90 highway through the Eastgate vicinity will make a positive contribution toward a more satisfying environment for local residents, with an increase in safety and mobility and reduction of travel times and travel cost. Some noise impact in residential areas is expected, as well as some temporary and minor impact of water due to possible erosion and construction processes. Disruption of small areas of natural vegetation and wildlife habitat have occurred. There are certain unavoidable adverse effects during and after consturction including displacement of families and businesses, loss of land available for other purposes, and inconvenience to the community during construction.

EIS-WA-73-1713-D-2/GA PC$5.50
Federal Highway Administration, Olympia, Wash. Washington Div.
SR 90, EASTGATE VICINITY, KING COUNTY, WASHINGTON. VOLUME II. EASTGATE AND SR 901 INTERCHANGE DRAINAGE.
Draft environmental impact statement.
29 Oct 73, 70p FHWA-WN-EIS-73-09-D ELR-73-1713-D-2
Prepared by Washington State Dept. of Highways.
See also Volume 1, WIS-WA-73-1713-D-1.

Descriptors: (*Environmental impact statements, *Highways), (*Washington(State), Environmental impact statements), Construction, Central city, Limited access highways, Eminent domain, Relocation, Sewers, Flood control.
Identifiers: Washington route 90, King County(Washington), Bellevue(Washington).

The project proposes construction of storm sewer systems in two locations to carry flows from the Eastgate area in the City of Bellevue and SR 901--SR 90 Interchange vicinity (King County). Two outfalls into Lake Sammamish at new locations are proposed. The total length of the two storm sewer systems is approximately 5,500 feet. The construction will probably cause some temporary detrimental effects such as erosion and siltation of natural stream beds, delta formation in Lake Sammamish, and some change in natural stream flow. Loss of vegetation and wildlife habitat will occur. Construction will also produce some noise and dust nuisance. Most adverse impacts will be temporary or minimized with careful construction practices. In addition ot present needs, the proposed completed system will satisfy future needs of drainage basins concerned. Flooding and siltation along stream banks as well as total delta formation in Lake Sammamish will be minimized.

EIS-WA-73-1714-D/GA PC$5.75
National Park Service, Seattle, Wash.
PROPOSED MOUNT RAINIER WILDERNESS, MOUNT RAINIER NATIONAL PARK, WASHINGTON.
Draft environmental impact statement.
29 Oct 73, 71p ELR-73-1714, DES-73-65

Descriptors: (*Environmental impact statements, *National parks), (*Washington(State), Environmental impact statements), Natural resources, Management, Recreational facilities.
Identifiers: Mount Rainier National Park.

The National Park Service proposes to establish as wilderness 202,200 acres in Mount Rainier National Park. Establishment of wilderness areas in Mount Rainier National Park will result in the preservation of the major portions of the park in a completely undeveloped state, allowing natural succession to continue without interference by man. No significant changes in management will be required, so impacts on adjacent lands or within the park will be minimal. Adverse effects include foregoing the possibility for development of additional visitor-use facilities and the possible restrictions upon backcounty use in the area designated as wilderness.

EIS-WA-73-1722-D-1/GA PC$12.75
Federal Power Commission, Washington; D.C. Bureau of Power.
LICENSE AMENDMENT, ROSS DEVELOPMENT OF PROJECT NO. 553, SKAGIT RIVER, WASHINGTON.
Draft environmental impact statement.
29 Oct 73, 213p FPC-PWR-553-D-1 ELR-73-1722-D-1
See also EIS-73-1722-D-2.

Descriptors: (*Environmental impact statements, *Hydro electric power generation), (*Washington(State), Environmental impact statements), Reservoirs, Dams, Turbines, Flood control, Flow control, National parks, Recreational facilities, Water quality, Skagit River.
Identifiers: Whatcom County(Washington).

The statement considers the application for amendment of the license of the Skagit River Project No. 553, located on the Skagit River in Whatcom County, Washington. Aproval of the license would provide for raising the structural height of Ross dam by 121 feet and raising the normal full reservoir elevation from 1,602.5 feet to 1,725 feet, constructing a new spillway, replacing the turbines with turbines designed for a higher head, and modifying outlet works, generators and transformers. The existing reservoir surface of about 11,680 acres at elevation 1,602.5 feet would be increased to approximately 20,000 surface acres at elevation 1,725 feet and would affect lands in both the United States and Canada. The U.S. section of the Ross reservoir is within the boundary of the Ross Lake National Recreation Area which is managed by the National Park Service of the U.S. Department of the Interior. The existing recreation facilities at Ross Lake would be relocated at a higher elevation in accordance with standards. The Ross development provides for flood control in addition to regulation the flow for hydroelectric power production. Environmental impacts are discussed.

EIS-WA-73-1722-D-2/GA PC$12.00
International Joint Commission-United States and Canada.
ENVIRONMENTAL AND ECOLOGICAL CONSEQUENCES IN CANADA OF RAISING ROSS LAKE IN THE SKAGIT VALLEY TO ELEVATION 1725. APPENDIX F.
Draft environmental impact statement.
29 Oct 73, 196p ELR-73-1722-D-2, FPC-PWR-553-D-2
See also EIS-WA-73-1722-D-1.

Descriptors: (*Environmental impact statements, *Hydroelectric power generation), (*Washington(State), Environmental impact statements), Lakes, Reservoirs, Flow control, Flood control, Ecology, Ross Lake, Skagit Valley, Canada.

This is the Report of the International Joint Commission on an inquiry into the environmental and ecological consequences in Canada resulting from raising ross Lake to elevation 1725 feet above mean sea level. To facilitate presentation the Report is in three parts. Part One, Chapters I to III, contains the Commission's response to the specific questions asked by the Reference. Part Two, Chapters IV to XI, provides the details of

the investigation and the basis for the Commission's conclusions. Part Three, Appendices A to F, contains supporting data.

EIS-WA-73-1743-D/GA PC$11.00
Federal Power Commission, Washington, D.C. Bureau of Power.
AMENDMENT TO ROCK ISLAND PROJECT NO. 943-WASHINGTON.
Draft environmental impact statement.
Oct 73, 176p FPC-PWR-943 ELR-73-1743

Descriptors: (*Environmental impact statements, *Hydroelectric power generation), (*Washington(State), Environmental impact statements), Licenses, Construction, Electric power plants, Turbines, Transmission lines, Reservoirs, Columbia River.
Identifiers: Chelan County(Washington), Wenatchee(Washington), Douglas County(Washington).

The statement proposes consideration of an application of the Public Utility District No. 1 of Chelan County, Washington, to amend its license to construct, operate, and maintain a second powerhouse at the Rock Island Project No. 943, located on the Columbia River in Chelan and Douglas Counties, Washington. The amended project would consist of a semioutdoor type powerhouse containing eight, horizontal shaft, bulb-turbine generator units (51.3 mw each), a new fish passage facility replacing the existing right bank fish ladder, extension of the existing middle and left bank fish ladders, addition of two miles of new 115-kv transmission lines, raising Rock Island reservoir 6.1 feet from 608.0 to 614.1 feet (U. S. G. S. datum), and other alterations to existing facilities to accommodate the raised reservoir forebay. The 18-unit project is estimated to have an average annual energy generation of 2,780 million kwh. Environmental impacts and adverse effects are discussed.

EIS-WI-73-1683-D/GA PC$10.75
Federal Highway Administration, Madison Wis. Wisconsin Div.
MADISON-BEAVER DAM ROAD (WILBURN ROAD-POSER ROAD), U.S.H. 151, DANE, COLUMBIA AND DODGE COUNTIES, AND COLUMBUS-RANDOLPH ROAD. S.T.H. 73, DODGE COUNTY.
Draft environmental impact statement.
24 Oct 73, 174p FHWA-WISC-EIS-73-19-D ELR-73-1683
Prepared by Wisconsin State Dept. of Transportation,

Descriptors: (*Environmental impact statements, *Highways), (*Wisconsin, Environmental impact statements), Construction, Traffic engineering, Eminent domain, Right of way acquisition.
Identifiers: US highway 151, Columbia County(Wisconsin), Dodge county(Wisconsin).

The report concerns the proposed U.S.H. 151 16.0-mile section of freeway from Sun Prairie, around Columbus, to a point 2.2 miles northeast of Columbus on existing U.S.H. 151, and the associated S.T.H. 73 1.5-mile relocation immediately northeast of Columbus. Completion of this section of freeway will be another step towards upgrading the Highway 151 corridor from Dubuque, Iowa to Madison, Wisconsin, Fond du Lac, the Fox River Vally, and Manitowoc. Columbus is the only city on U.S.H. 151 between Madison and Fond du Lac which has not been bypasses. In acquiring the right of way it was necessary to relocate four families and purchase 521 acres of farmland, 74 acres of wetland, and 25 acres of woodland. The project will induce changes in nearby land use, especially in and around the interchanges. Noise, air and water pollution will not increase significantly except along the relocated sections where no highway now exists.

EIS-WI-73-1719-F/GA PC$3.75/MF$1.45
Federal Highway Administration, Madison, Wis. Wisconsin Div.
CONNORSVILLE-EAST COUNTY LINE ROAD, PROJECT ID 8110-4-00;-4-00;S-059(), S.T.H.64, DUNN COUNTY, WISCONSIN.
Final environmental impact statement.
29 Oct 73, 35p FHWA-WIS-EIS-73-04-F ELR-73-1719
Supersedes report No. EIS-WI-EIS-73-0554-D. Prepared by Wisconsin State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Wisconsin, Environmental impact statements), Construction, Rebuilding, Traffic safety, Accident prevention, Right of way acquisition, Land use.
Identifiers: Dunn County(Wisconsin), Wisconsin highway 64.

The project consists of the construction of 6.5 miles of STH 64 as a standard arterial highway, in Dunn County, Wisconsin. Except for about one mile of relocation, the proposed facility follows the existing roadbed. The reconstruction will provide a safer and more efficient highway facility and improve two hazardous intersections. The project will require acquisition of 20 acres of woodland, 85 acres of farmland, and 12 acres of wetlands. No important adverse effects are anticipated.

EIS-WI-73-1731-D/GA PC$4.75
Army Engineer District, Chicago, Ill.
MAINTENANCE DREDGING AT PORT WASHINGTON, WISCONSIN.
Draft environmental impact statement.
31 Oct 73, 52p ELR-73-1731

Descriptors: (*Environmental impact statements, *Channel improvements), (*Wisconsin, Environmental impact statements), Harbors, Dredging, Disposal, Benthos, Navigation.
Identifiers: Port Washington Harbor.

The proposal is for maintenance dredging to be performed periodically in the future at the Port Washington Navigation Project. It is anticipated that approximately 10,000 cubic yards of polluted sediment will be removed annually from the Port Washington Harbor over the next ten year period. These polluted sediments will be disposed of in a diked disposal area located in the south outer section of the Milwaukee Harbor. Approximately 5,000 cubic yards of unpolluted sediments will also be dredged annually from the harbor. These will be disposed of in the established deep water disposal area. The environmental impacts include: Physical alteration of the sediment-water interface in the channel and adjacent areas; destruction or displacement of organisms inhabiting channels and adjacent areas; resuspension of polluted sediments into an aquatic system; reintroduction of toxic and nutritive substances into lake system; and maintenance of the deep draft commercial harbor.

EIS-WI-73-1742-D/GA PC$4.50
Army Engineer District, Chicago, Ill.
MAINTENANCE DREDGING AT MILWAUKEE HARBOR, WISCONSIN.
Draft environmental impact statement.
5 Nov 73, 50p ELR-73-1742.

Descriptors: (*Environmental impact statements, *Channel improvements), (*Wisconsin, Environmental impact statements), Dredging, Navigation, Harbors, Spoil, Benthos, Turbidity, Water pollution.
Identifiers: Milwaukee Harbor.

Maintenance dredging is to be performed at the Milwaukee Navigation Project periodically during the future. It is anticipated that 100,000 cubic yards of spoils will be removed annually. The disposal of 10 years dredge spoils from the navigation project will take place within the dike containment structure located in the south outer harbor. Environmental impacts: Disruption of benthic community residing on or in the sediments to be dredged; the creation of minor turbidity plumes during the dredging operation; the potential reintroduction of toxic and nutritive substances into the local waters; maintenance of an economically valuable port facility; disruption and destruction of the benthos by the dredging operations; the creation of the temporary turbidity; and the redistribution of toxic and nutritive substances.

EIS-WV-73-1729-D/GA PC$4.75
Army Engineer District, Huntington, W. Va.
BEECH FORK LAKE, BEECH FORK, CREEK, TWELVEPOLE CREEK BASIN, CABELL AND WAYNE COUNTIES, WEST VIRGINIA.
Draft environmental impact statement.
31 Oct 73, 53p ELR-73-1729

Descriptors: (*Environmental impact statements, *Multiple purpose reservoirs), (*West Virginia, Environmental impact statements), Flood control, Recreational facilities, Wildlife, Land acquisition, Farms, Fishing.
Identifiers: Wayne County(West Virginia), Cabell County(West Virginia).

The proposal concerns construction of a dam and operation of a 720 surface acre multiple purpose lake and other facilities to provide for flood control, recreation, fish and wildlife conservation, and incidental redevelopment benefits. The project site is about six miles south of Huntington, W. Va. in Wayne and Cabell Counties. Environmental impacts are: Changed land uses on lands being acquired; conversion of natural stream to a lake; regulation of downstream flow for flood control; increase low flow; and provisions for water related outdoor recreation; and improved fish and wildlife management; disruption of lives of people occupying lands being acquired; loss of rural farm and pasture lands; and loss of natural stream reach with associated aquatic and terrestrial habitat.

EIS-WY-73-1723-D/GA PC$5.75
Forest Service, Denver, Colo. Rocky Mountain Region.
MANAGEMENT PROPOSALS FOR THE CLOUD PEAKS PRIMITIVE AREA AND CONTIGUOUS LANDS OF THE BIGHORN MOUNTAIN RANGE, BIGHORN NATIONAL FOREST, WYOMING.
Draft environmental impact statement.
30 Oct 73, 72p USDA-FS-DES(Leg)-74-36 ELR-73-1723

Descriptors: (*Environmental impact statements, *National parks), (*Wyoming, Environmental impact statements), Natural resources, Management, Recreational facilities, Bighorn mountain.
Identifiers: Bighorn National Forest.

The Forest Service has reviewed the Cloud Peak Primitive Area and contiguous lands of the Big Horn Mountain Range on the Bighorn National Forest, Wyoming, for suitability and non-suitability for their inclusion in the National Wilderness Preservation System. This brochure sets forth the results of the Forest Service review which was made pursuant to the Multiple Use-Sustained Yield Act of June 12, 1960, and the Wilderness Act of September 3, 1964. Topics discussed include the following: Resources of the review area; management to date; key values of the review area; and management alternatives proposed for the review area.

HEDL-TME-73-17/GA PC$7.75/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
THERMAL EFFECTS OF PROJECTED POWER GROWTH: PACIFIC RIVER BASINS.
D. E. Peterson, P. M. Schrotke, S. L. Engstrom, and G. F. Bailey. Mar 73, 112p
Contract AT(45-1)-2170

Descriptors: (*Power plants, *Thermal effluents), (*Rivers, *Thermal pollution), Colorado river, Cooling, Earth atmosphere, Electric power, Heat transfer, Power reactors, Reactor cooling systems, Waste heat, Water pollution.

For abstract, see NSA 28 07, number 15496.

N73-30754/8GA PC$7.50/MF$1.45
General Applied Science Labs., Inc., Westbury, N.Y.
A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTOR POLLUTANT EMISSIONS.
Technical Report, 19 Jul. 1971 - 31 Jan. 1973.
J. L. Boccio, G. Weilerstein, and R. B. Edelman. Mar 73, 106p NASA-CR-121208, GASL-TR-781
Contract NASW-2235

Descriptors: *Combustion products, *Gas turbines, *Mathematical models, Fluid dynamics, Reaction kinetics, Turbulent mixing.

For abstract, see STAR 1121

N73-31581/4GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AIRBORNE MEASUREMENTS OF AIR POLLUTION CHEMISTRY AND TRANSPORT. 1: INITIAL SURVEY OF MAJOR AIR BASINS IN CALIFORNIA.
H. R. Gloria, J. N. Pitts, Jr., J. V. Behar, G. A. Bradburn, and R. F. Reinisch. 30 Sep 72, 41p NASA-TM-X-69504, SAPRC-1
Contract NGR-05-008-029
Subm-Prepared in Cooperation with Calif. Univ., Riverside.

Descriptors: *Air pollution, *California, *Pacific ocean, *Photochemical reactions, Aerial reconnaissance, Airborne equipment, Coastal water, Mathematical models.

For abstract, see STAR 1122

N73-31584/8GA PC$6.75/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany). Inst. fuer Physik der Atmosphaere.
RESEARCH WORK OF THE DFVLR IN THE FIELD OF ENVIRONMENTAL PROTECTION. PART 1: AIR CLEANLINESS.
D. Paffrath. 30 May 72, 93p DLR-MITT-72-14-PT-I
In German; English Summary.

Descriptors: *Air breathing engines, *Air pollution, *Atmospheric boundary layer, Emission, Environmental quality, Exhaust gases, Meteorological parameters, Monitors, Remote sensors.

For abstract, see STAR 1122

ORNL-NSF-EP-56/GA PC$5.50/MF$1.45
Oak Ridge National Lab., Tenn.
DEVELOPMENT OF AIR QUALITY INDICES. SUMMARY REPORT.
W. D. Shults, and J. J. Beauchamp. Jul 73, 69p
Contract W-7405-eng-26

Descriptors: (*Air pollution, *Information systems), Environment, Fortran, Indexes, Information retrieval, Programming languages.

For abstract, see NSA 28 07, number 15504.

ORNL-NSIC-110/GA PC$12.00/MF$1.45
Oak Ridge National Lab., Tenn.
INDEXED BIBLIOGRAPHY OF THERMAL EFFECTS LITERATURE-3.
J. G. Morgan. Jul 73, 230p
Contract W-7405-eng-26

Descriptors: (*Thermal effluents, *Bibliographies), (*Thermal pollution, Bibliographies), Air pollution, Aquatic ecosystems, Biological effects, Dispersions, Meteorology, Plumes, Surface waters, Water pollution.

For abstract, see NSA 28 08, number 18246.

PAT-APPL-390467/GA PC$3.25/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
RAW LIQUID WASTE TREATMENT SYSTEM AND PROCESS.
Patent Application.
M. F. Humphrey. Filed 22 Aug 73, 24p NASA-CASE-NPO-13224-1,
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Sewage, *Water treatment, Organic materials, Patent applications, Waste disposal.

A description is given of a raw sewage treatment process where all organic matter is dissolved in the sewage liquid. All non-dissolved matter suspended in the sewage is pyrolyzed to form an activated carbon and ash materials without addition of any conditioning agents. The activated carbon and ash material is added to the water from which the non-dissolved matter was removed. The activated carbon and ash material adsorbs the organic matter which is dissolved in the water and is thereafter supplied in a counter current flow direction, and combines with the incoming raw sewage to facilitate the separation of non-dissolved settleable materials from the sewage water. The used carbon and ash material together with the non-dissolved matter which was separated from the sewage water are pyrolyzed to form the activated carbon and ash material.

PB-223 695/8GA PC$9.00/MF$1.45
Purdue Univ., Lafayette, Ind. School of Mechanical Engineering.
MEASURING PAVEMENT ROUGHNESS SPECTRA USING THE MODIFIED BPR ROUGHOMETER WITH ADDITIONAL REFINEMENTS.
Final rept.,
B. E. Quinn, and L. M. Smeyak. Nov 72, 137p
FHWA-RD-72-27
Contract FH-11-7797

Descriptors: (*Pavements, *Surface roughness), (*Profilometers, Performance evaluation), Nondestructive tests, Measuring instruments, Electronic test equipment, Seismic waves, Power spectra, Resonant frequency, Spectrum analyzers, Spectrum analysis.

Additional refinements were made in the mechanical and electrical systems of a modified BPR Roughometer in order to improve the capability of this equipment for measuring pavement roughness power spectra. The pavement roughness spectra of seven different pavement sections were obtained in the process of field testing this equipment. These roughness spectra are presented in the form of plotted curves in this report. (Author)

PB-223 796/4GA PC$4.75/MF$1.45
Ohio State Univ., Columbus. Engineering Experiment Station.
MEASUREMENT OF MECHANICAL STRESSES USING PIEZOELECTRIC CRYSTALS.
Final rept.,
R. C. McMaster, and M. L. Rhoten. Dec 72, 52p
EES-292
Sponsored by The Ohio Dept. of Highways and the Federal Highway Administration.

Descriptors: (*Piezoelectric crystals, Determination of stress), (*Vehicular traffic, Counting), Vehicular traffic control, Piezoelectric transducers, Feasibility, Piezoelectricity, Ceramics, Mechanical hysteresis, Field tests.

The research program was initiated with a feasibility study on the possible uses of piezoelectric ceramic materials for the measurement of mechanical energies related to highway problems. This interest was generated because modern man-made piezoelectric ceramic materials exhibit the property of generating an electrical signal of considerable magnitude when mechanical stresses are applied to the crystal. Upon completion of the fundamental study it was evident that piezoelectric ceramic transducers could be used to measure mechanical forces in various applications to highway problems. The choice was made to develop equipment for the measurement of vehicular traffic on rigid highways. A unit was designed and constructed to measure traffic density. This unit is referred to as Prototype I. A second unit, Prototype 2 was developed to weigh each individual axle of a passing vehicle and summarize these signals for the total weight of the vehicle. Prototype I has been completed and laboratory and limited field tests have been conducted. Prototype 2 has been built but no tests have been conducted. (Modified author abstract)

PB-223 996/0GA PC-GPO/MF$1.45-NTIS
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air and Water Programs.
COMPILATION OF AIR POLLUTANT EMISSION FACTORS (SECOND EDITION).
Apr 73, 288p* AP 42
Supersedes report No. PB-209 559.
Paper copy available from GOP $3.55 as stock no. EP4.9:42.

Descriptors: (*Air pollution, *Industrial wastes), (*Transportation, Air pollution), (*Chemical industry, Air pollution), (*Food processing, Air pollution), (*Metal industry, Air pollution), (*Petroleum industry, Air pollution), (*Paper industry, Air pollution), (*Solid waste disposal, Air pollution), Combustion rate, Concentration(Composition), Exhaust gases, Combustion product, Coal, Fuel oil, Incinerators, Dry cleaning, Gasoline, Organic solvents, Cements, Ceramic materials, Evaporation, Sources.
Identifiers: *Cement industry.

Emission data obtained from source tests, material balance studies, engineering estimates, etc., have been compiled for use by individuals and groups responsible for conducting air pollution emission inventories. Emission factors given in this document, the result of the expansion and continuation of earlier work, cover most of the common emission categories: fuel combustion by stationary and mobil sources; combustion of solid wastes; evaporation of fuels, solvents, and other volatile substances; various industrial processes; and miscellaneous sources. When no source-test data are available, these factors can be used to estimate the quantities of primary pollutants (particulates, carbon monoxide, sulfur dioxide, nitrogen oxides, and hydrocarbons) being released from a source or source group. (Author)

PB-224 084/4GA PC$5.25/MF$1.45
Transport and Road Research Lab., Crowthorne (England).
TRANSYT METHOD FOR AREA CONTROL PROGRAM - MANUAL.
Final rept.,
Dennis I. Robertson. Aug 72, 62p
See also mag tape PB-224 085.

Descriptors: (*Vehicular traffic control, Traffic signals), (*Traffic signals, *Computer programming), Network flows, Programming manuals, Optimization, FORTRAN, Great Britain.
Identifiers: TRANSYT computer program, FORTRAN 4 programming language, IBM 360 computers.

TRANSYT is a method of optimizing traffic signals of a network. It is a computer program

written in FORTRAN 4 and has been implemented on an IBM System 360 computer. The document describes the input and output formats. The basic input data requirements are link demand volume and saturation flow capacity; link length and speed; estimated initial signal offsets and phase durations; left turn, right turn, and through volumes for each link. TRANSYT can optimize networks having up to 50 signalized intersections and 200 links. It can be altered to accommodate larger networks, but will then require more computer storage. Printout includes summary statistics of the network as well as optimal signal settings for each intersection. Diagrams of arrival and discharge flow rate patterns for each intersection are also printed out. Sample data sheets and a worked-out example of a hypothetical network are included.

PB-224 085/1GA Mag Tape $250.00;Foreign $325.00
Transport and Road Research Lab., Crowthorne (England).
TRANSYT METHOD FOR AREA CONTROL PROGRAM - MAG TAPE.
Final rept.,
Dennis I. Robertson. Aug 72, 1 reel mag tape
See also the manual, PB-224 084.
Specify tape recording mode desired: 7 track, 556 or 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: (*Vehicular traffic control, Traffic lights), (*Traffic lights, *Computer programming), Magnetic tapes, FORTRAN, Great Britain.
Identifiers: TRANSYT computer program, FORTRAN 4 programming language, IBM 360 computers.

The tape contains a source program of the TRANSYT/5 computer program. The source code is written in FORTRAN 4, and has been implemented on an IBM/360. Every 80 character record in the source program is numbered by thousands in card columns 73 thru 80, starting with 00001000 and ending with 02547000. The tape contains one file, with an EOF following the last logical record. The records are fixed length (80 characters) and blocked 21 records per block. The tape contains standard IBM labels, with serial number ESD028. Tape density is 800 bits per inch. File data set name is TRANSYT. The tape was created using the IBM utility: IEBGENER on an IBM 360/65 Operating System, MFT, with HASP - Release 21.6.

PB-224 091/9GA PC$3.00/MF$1.45
Federal City Coll., Washington, D.C.
A STATISTICAL SUMMARY OF THE CAUSE AND COST OF BRIDGE FAILURES.
Final rept.,
Fred F. M. Chang. Sep 73, 47p*
Contract FH-11-8093

Descriptors: (*Highway bridges, Failure), (*Floods, Damage assessment), Flooding, Flood control, Bridge approaches, Superstructures, Bridge piers, Erosion, Cost estimates.

The report presents a statistical summary of the cause and cost of bridge failures based only on a review of damage reports in the FHWA Emergency Relief files for major floods that have occurred during the last few years. As was anticipated, these reports yielded very limited reliable data, so the dollar projections must be viewed accordingly. The general trends, however, should serve as guideline for future research in related areas. Of 383 cases, 14.9 percent reported damages to the superstructure, 24.5 percent to the pier, and 71.8 percent to the abutment; in 43.2 percent of the cases, the damage extended to the approach roads. In 341 cases where the causes of failure were either stated in the original files or theorized by the reporter, only 6.9 percent of the failures were attributed to riverbed changes (aggradation and degradation), 29.6 percent were attributed to vigorous change in flow, 38.8 percent to flowpath deficiency, 20 percent to floating debris, and only 4.7 percent to structural deficiency. (Modified author abstract)

PB-224 155/2GA PC$4.75/MF$1.45
Environmental Protection Agency, Cincinnati, Ohio. Office of Water Program Operations.
INDUSTRIAL LIQUID WASTE SURVEYS: TRAINING MANUAL,
Charles E. Sponagle. Jan 73, 154p* EPA-430/1-73-002

Descriptors: (*Industrial wastes, Investigations), (*Manuals, Industrial wastes), Surveys, Industrial water, Chemical analysis, Sampling, Water pollution, Cooling water, Bioassay.
Identifiers: Thermal pollution, Water pollution effects(Animals), Water pollution effects(Plants).

This training manual consists of a series of outlines on various topics associated with the planning and conduct of in-plant industrial waste surveys. The manual is divided into five sections: I - Sources and Effects, which includes outlines concerning industrial water use, sources of liquid wastes, and effects of types of pollutants on aquatic life; II - Survey planning, in which the several factors to be considered in planning and conducting an in-plant survey are discussed; III - Analytical Procedures, which includes outlines for the analytical determinations specific to this course; IV - Conducting the survey, in which procedures for sampling and measuring flows are outlined, and; V - Survey Evaluation and Report, which includes material relevant to reporting survey results, and pertinent features concerning court proceedings in which water quality evidence may be used.

PB-224 158/6GA PC$13.50/MF$1.45
Systems Development Corp., Santa Monica, Calif.
DIAMOND INTERCHANGE TRAFFIC CONTROL. VOLUME 3. PROGRAM MANUAL FOR MICROSCOPIC SIMULATION MODEL OF DIAMOND INTERCHANGE TRAFFIC OPERATIONS.
Final rept.,
B. D. Widdice. May 72, 229p SDC-TM-4601/010/01 FHWA-RD-73-36
Contract FH-11-7568
See also Volume 2, PB-217 518.

Descriptors: (*Vehicular traffic control, *Interchanges), (*Traffic engineering, Mathematical models), Operations research, Efficiency, Traffic signals, Computer programming, Simulation, Manuals, computer logic, Computer programs, Constraints, California.
Identifiers: JOVIAL programming language, Computerized simulation, Los Angeles(California), Simulation models, Diamond interchanges.

Results of a research contract to improve the operational efficiency of high demand signalized diamond interchanges are presented in a six-volume report. In this volume, a manual has been developed to assist users of a digital computer simulation model of detailed traffic operations in a diamond interchange, including the two nearby signalized intersections. The model employs microscopic modeling techniques. It has been programmed in JOVIAL, a high-level computer language for IBM 360 (or 370) digital computers under the OS/360 operating system. The model can accommodate parameter value changes in geometrics, signal control, and demand distributions. Traffic operations such as average travel time, speed, and queue length are provided. This information can be provided on a section or an overall system basis.

PB-224 159/4GA PC$3.75/MF$1.45
Systems Development Corp., Santa Monica, Calif.
DIAMOND INTERCHANGE TRAFFIC CONTROL. VOLUME 7. DIAMOND INTERCHANGE TRAFFIC CONTROL INTERFACE UNIT.
Final rept.,
C. T. Barooshian. Jul 73, 31p SDC-TM-4601/012/01 FHWA-RD-73-56
Contract FH-11-7568
See also Volume 9, PB-224 160.

Descriptors: (*Vehicular traffic control, *Interchanges), (*Traffic signals, *Computer programming), Interfaces, Traffic engineering, Demand(Economics), Compatibility, Data acquisition, Data storage, Detectors, Timing circuits, Digital techniques, Components, Input output devices(Computers), California.
Identifiers: VARIAN 620/i computers, Command systems, Diamond interchanges, Los Angeles(California).

Discussed in the report is the traffic control interface unit that interfaces a VARIAN 620/i to the street electronics at the Santa Monica freeway Western Avenue test site. Included is a discussion on the general configuration, detector configuration with identifying numbers, and a description and specification of the logic modules. Input data word and output word formats are also defined. Maintenance documentation is included as an appendix.

PB-224 160/2GA PC$10.75/MF$1.45
Systems Development Corp., Santa Monica, Calif.
DIAMON INTERCHANGE TRAFFIC CONTROL. VOLUME 9. TEST AND EVALUATION OF COMPUTERIZED TRAFFIC CONTROL SYSTEM.
Final rept.,
J. F. Torres. Jul 73, 175p SDC-TM-4601/015/01 FHWA-RD-73-58
Contract FH-11-7568
See also Volume 11, PB-224 161.

Descriptors: (*Vehicular traffic control, *Interchanges), (*Traffic engineering, *California), (*Automatic control equipment, *Performance evaluation), Field tests, Data acquisition, Monitors, Detectors, Computer programming, Urban areas, Comparison.
Identifiers: Diamond interchanges, Santa Monica freeway, Los Angeles(California), Loop detectors, *Computer aided control systems.

The Western Avenue interchange of the Santa Monica Freeway in Los Angeles, California, was instrumented to operate under computerized traffic control. A series of tests was conducted to evaluate the operational performance of the system with respect to pretimed, three-dial operation. The surveillance system, which is part of the computerized system, was used as one of the basic methods of collecting operational data. Floating-car tests were also conducted over the facility. Real-time control of the facility produced reductions in delay in the order of 20-30 percent. Stop time and number of stops were also reduced. The degree of improvement obtained demonstrated that the computerized control system is cost/effective.

PB-224 161/0GA PC$5.25/MF$1.45
System Development Corp., Santa Monica, Calif.
DIAMOND INTERCHANGE TRAFFIC CONTROL. VOLUME 11. FUNCTIONAL SPECIFICATIONS FOR A DIAMOND INTERCHANGE SIGNAL CONTROLLER.
Final rept.,
C. T. Barooshian. Jul 73, 63p SDC-TM-4601/014/01 FHWA-RD-73-60
Contract FH-11-7568
See also Volume 12, PB-224 162.

Descriptors: (*Vehicular traffic control, *Interchanges), (*Automatic control equipment, Specifications), (*Traffic signals, *Computer programming), Reviews, Requirements, Special purpose computers, Design, Algorithms, Per-

formance tests, Real time operation, Freeways, California.
Identifiers: Diamond interchanges, Signalization characteristics, Santa Monica freeway, Computer aided control systems, Los Angeles(California), Varian 620/i computers.

This specification defines the requirements of a special-purpose diamond interchange traffic controller that will utilize less computational power than the typical mini-computer, at less cost, and yet perform the required functions. The first section presents a summary of geometric design and signalization characteristics of diamond interchanges. The second discusses system configuration alternatives. The third discusses traffic signal control programs. The fourth section descusses functional implementation requirements. The specification relates to the establishment of a real-time control system at the Western Avenue diamond interchange of the Santa Monica freeway.

PB-224 162/8GA PC$5.50/MF$1.45
System Development Corp., Santa Monica, Calif.
DIAMOND INTERCHANGE TRAFFIC CONTROL. VOLUME 12. AN ANALYSIS OF DIAMOND INTERCHANGE SIGNALIZATION.
Final rept.,
P. K. Munjal. Aug 70, 66p SDC-TM-4601/01/001/00 FHWA-RD-73-61
Contract FH-11-7568
See also Volume 14, PB-224 163

Descriptors: (*Vehicular traffic control, *Interchanges), (*Traffic signals, *Systems engineering), Computer programming, Concepts, Phase, Reviews, Methodology, Pattern recognition, Evaluation, Comparison, Real time operations, Effectiveness. California.
Identifiers: *Computer aided control systems, Diamond interchanges, Los Angeles(California).

The report presents a systematic approach to the signalization of diamond interchanges. Attention is directed to signalization concepts which are applicable to the real-time control of diamond interchanges. A critical review of the phasing practices currently used for diamond interchanges is also provided. One of the principal products of this study is the identification of all the basic elements that make up a phasing pattern. After evaluating each phasing pattern developed, two preferred sets of phasing patterns are identified. A pair of typical diamond interchange phasing patterns from the field are described for the two different preferable situations. Applicability of the above phasing concepts to the real-time control of diamond interchanges is also discussed.

PB-224 163/6GA PC$5.50/MF$1.45
System Development Corp., Santa Monica, Calif.
DIAMOND INTERCHANGE TRAFFIC CONTROL. VOLUME 14. DEVELOPMENT AND EVALUATION OF REAL-TIME CONTROL ALGORITHMS.
Final rept.,
P. K. Munjal, and U. S. Hsu. Apr 71, 70p SDC-TM-4601/003/01 FHWA-RD-73-63
Contract FH-11-7568
See also Volume 15, PB-224 164.

Descriptors: (*Vehicular traffic control, *Interchanges), (*Control theory, Algorithms), Traffic signals, Real time operations, Evaluation, Travel time, Delay time, Performance tests, Computer programming, Urban areas, California.
Identifiers: Diamond interchanges, *Computer aided control systems, Los Angeles(California).

The report discusses the results of a study for indentifying and developing control algorithms that are suitable for computer-controlled signal systems of a diamond interchange complex. Twelve candidate traffic signal control algorithms have been developed. The candidate control algorithms for the real-time control of diamond interchanges have been tested and evaluated on the basis of travel time and delay. The results of the evaluation have identified preferred sets of control algorithms.

PB-224 164/4GA PC$3.50/MF$1.45
System Development Corp., Santa Monica, Calif.
DIAMOND INTERCHANGE TRAFFIC CONTROL. VOLUME 15. A COMPARISON OF SIGNAL CONTROL STRATEGIES ON A DIGITAL COMPUTER SIMULATION MODEL.
Final rept.,
J. F. Torres. Jun 71, 30p SDC-TM-4601/006/01 FHWA-RD-73-64
Contract FH-11-7568
See also Volume 16, PB-224 165.

Descriptors: (*Vehicular traffic control, *Interchanges), (*Traffic signals, *Systems engineering), (*Automatic control, Mathematical models), Computer programming, Comparison, Traffic engineering, Simulation, Digital computers, Time, Methodology, California.
Identifiers: Diamond interchanges, *Signal control technologies, Simulation models, Los Angeles(California).

The report presents a comparison of three signal control strategies for operating traffic signals at a diamond interchange complex. The comparisons were made by using a digital computer simulation. The original, field signal timing plan for the interchange complex was used as a baseline for determining the degree of improvement expected with new timing methodology (both fixed time and real-time) developed in other research phases of this project. This publication has been used as a partial basis for justifying the installation of a computer-controlled traffic signal system located at Western Avenue and Santa Monica Freeway in Los Angeles, California.

PB-224 165/1GA PC$3.00/MF$1.45
System Development Corp., Santa Monica, Calif.
DIAMOND INTERCHANGE TRAFFIC CONTROL. VOLUME 16. SUMMARY REPORT ON CONTROL AND GEOMETRIC DESIGN OF DIAMOND INTERCHANGE.
Final rept.,
J. F. Torres. Jul 73, 35p* SDC-TM-4601/017/01 FHWA-RD-73-65
Contract FH-11-7568
See also Volume 15, PB-224 164.

Descriptors: (*Vehicular traffic control, *Interchanges), (*Traffic signals, *California), (*Automatic control, *Systems engineering), Geometry, Highways, Digital computers, Simulation, Mathematical models, Correlations, Control theory, Performance evaluation, Urban areas, Manuals, Computer programming, Field studies.
Identifiers: *Diamond interchanges, *Computer aided control systems, Command systems, Computerized simulation, Los Angeles(California).

A comprehensive investigation of signalized diamond interchanges including the nearby signalized intersections was conducted. A summary of the principal findings is presented. The geometrics and signalization characteristics of a large representative sample of existing diamond interchanges is first discussed. Digital computer simulation models of traffic operations in diamond interchanges were developed. These models were validated against aerially-collected time-lapse photographic data. The models were used, in turn, to perform several substudies. The program culminated in the development of a second-generation computerized traffic control system on an operational interchange in the city of Los Angeles.

PB-224 185/9GA PC$4.75/MF$1.45
Tennessee State Planning Commission, Knoxville. East Tennessee Office.
SUBDIVISION REGULATIONS FOR LAFOLLETTE, TENNESSEE.
Final rept.,
Jack Gray, Earl Freeman, James Freeman, Buck Violet, and Ike Peters. Feb 72, 52p TN-LAFE-2-72-138-1
Prepared in cooperation with LaFollette Regional Planning Commission, Tenn.

Descriptors: (*Urban planning, *Tennessee), (*Land use zoning, Ordinances), Boundaries, Regulations, Residential buildings, Streets, Law enforcement, Penalties, Revisions.
Identifiers: *LaFollette(Tennessee).

These regulations govern the subdivision of land in the LaFollette, TN planning region. They establish uniform minimum standards for design and establish a procedure for plat review, approval, and acceptance.

PB-224 205/5GA PC$2.75/MF$1.45
Environmental Protection Agency, Research Triangle Park, N.C. Monitoring and Data Analysis, Div.
A TECHNIQUE FOR CALCULATING OVERALL EFFICIENCIES OF PARTICULATE CONTROL DEVICES,
William M. Vatavuk. Aug 73, 24p* EPA-450/2-73-002

Descriptors: (*Air pollution control equipment, *Particles), Electrostatic precipitators, Cyclone separators, Scrubbers, Settlers(Separators), Numerical analysis, Efficiency, Particle size distribution, Dust collectors.
Identifiers: *Air pollution control.

A generailized mathematical technique is developed to calculate the overall collection efficiency of particulate control devices. Equipment operating parameters and the size distribution of the particles in the inlet gas stream are used in the calculation. The technique is successively applied to efficiency calculations for settling chambers, cyclones, venturi scrubbers, and electrostatic precipitators. Extension of this mathematical method is made to encompass control devices operated in series. Specific examples are also included to illustrate the technique when it is applied to single and multiple devices. (Author)

PB-224 212/1GA PC$8.00/MF$1.45
Environmental Protection Agency, Cincinnati, Ohio.
CHEMICAL ANALYSES FOR WATER QUALITY. TRAINING MANUAL,
Audrey E. Donahue. Feb 73, 394p* EPA-430/1-73-003

Descriptors: (*Water analysis, Manuals), (*Water pollution, Water analysis), Criteria, Acidity, Alkalinity, Dissolved gases, Oxygen, Ammonia, Nitrates, Nitrogen, Chlorine, Carbon, Calcium, Magnesium, Electrical resistivity, Phosphorus, Cyanides, Iron, Manganese, Phenols, Chlorine aromatic compounds, Detergents, Surfactants, Pesticides, Spectroscopic analysis, Flame photometry, Atomic spectroscopy, Organic compounds, Gas chromatography, Chromatography, Infrared spectroscopy, Automation, Aerial reconnaissance, Legal processes, Metals.
Identifiers: *Water pollution detection.

This training manual contains outlined information used by lecturers when presenting topics in EPA-NTC Course 100, 'Chemical Analyses for Water Quality.' The contents concern individual constituents found in water (e.g. dissolved oxygen), instrumental methodology (e.g., atomic absorption) and information useful to analysts (e.g., statistics). A section of laboratory procedures used by class groups is also included.

PB-224 254/3GA PC$10.25/MF$1.45
Oregon State Executive Dept., Salem. Local Government Relations Div.
CLATSOP-TILLAMOOK INTERGOVERNMENTAL COUNCIL ANNUAL WORK PROGRAM 1972-73.
Aug 72, 162p LGRD-72-1-01

Prepared in cooperation with Clatsop-Tillamook Intergovernmental Council, Cannon Beach, Oreg. Sponsored in part by Department of Housing and Urban Development, Washington, D.C.

Descriptors: (*Regional planning, *Oregon), Land use, Surveys, Demography, Residential buildings, Facilities, Economic analysis, Management, Development, Reviews.
Identifiers: Clapsop Tillamook Intergovernmental Council, Open space studies.

The report is designed to fulfill the inventory needs and preliminary goals establishment for the Oregon District 1 regional plan. The report contains an interim land use and open space plan with goals. Detailed population, housing, public facility and economic data are included in the text with maps and tables. An appendix contains supplementary material and management information. (Author)

PB-224 264/2GA PC$4.25/MF$1.45
Panhandle Regional Planning Commission, Amarillo, Tex.
A STUDY OF BUILDING CODES AS RELATED TO CRIME PREVENTION.
Final research rept.
Sep 72, 110p* HUD-CJC-72-20
Prepared by Peat, Marwick, Mitchell and Co.,

Descriptors: (*Crimes, Prevention), (*Building codes, *Texas), Feasibility, Revisions, Urban planning, Research, Information systems, Public relations, Police, Incentives, Specialized training, Insurance, Ordinances, Security, Education, Recommendations, Residential buildings.
Identifiers: Panhandle region(Texas).

The report examines the relationship between building codes and crime prevention. Research conducted by other organizations is referenced and recommendations are made in four areas: public information activities, law enforcement officer training, insurance premium reduction incentives, and security ordinances. For the Panhandle region a public education and incentive program is recommended for the immediate future rather than amendment of building codes or adoption of security ordinances.

PB-224 265/9GA PC$3.00/MF$1.45
Panhandle Regional Planning Commission, Amarillo, Tex.
TEXAS PANHANDLE HOUSING SURVEY.
Final rept.
Jul 73, 20p HUD-TX-73-33

Descriptors: (*Regional planning, *Texas), (*Residential buildings, Regional planning), Surveys, Quality, Rural areas, Urban areas, Classifications.

The report examines the relative condition of housing in the Texas Panhandle. Using the Texas housing survey pictorial method, a sample of housing units was evaluated and the results tabulated. Over 80 percent of the dwelling units in the Panhandle are unquestionably habitable. Another 12% need manor repairs, while 5% are clearly inadequate. An interpretation of these statistics is made. The percent of the Panhandle's housing stock of various types of housing is quantified and compared. Vacancy rates in different ranges of housing quality are presented. (Author)

PB-224 274/1GA PC$4.75/MF$1.45
Ultrasystems, Inc., Irvine, Calif.
EXPERIMENTAL COMBUSTOR FOR DEVELOPMENT OF PACKAGE BOILER EMISSION CONTROL TECHNIQUES. PHASE I.
Environmental Protection Technology series.
L. J. Muzio, and R. P. Wilson, Jr. Jul 73, 53p EPA-R2-73-292a
Contract EPA-68-02-0222
Prepared by American Petroleum Institute, Wash. D.C.

Descriptors: (*Combusion chambers, Test equipment), (*Air pollution, *Combustion products), Nitrogen oxides, Carbon monoxide, Oxygen, Smoke, Boilers, Fuel oil, Design, Tests.
Identifiers: Air pollution control.

The report describes Phase I of a program during which a unique 3.7 million Btus/hr oil combustor was designed and built to develop NOx control techniques f or small boilers. The facility duplicates key aspects of oil flames of representative boilers in the 1 million to 1 billion Btu/hr range, and can recycle and inject any amount of flue gas or air at unconventional sites on the combustion boundary. The facility can also measure all flows (air, fuel, and flue gas), temperatures along the combustor, and NOx, CO, O2, and smoke emissions. Preliminary tests indicate that emissions from the combustor operating on No. 6 oil, are consistent with emissions from field-tested package boilers. In Phase two, the combustor will be used to screen many different applications of combustion modification techniques for controlling pollutant emissions. Phase three will include long-term testing of the optimum configurations.

PB-224 282/4GA PC$7.00/MF$1.45
Singmaster and Breyer, New York.
AIR POLLUTION CONTROL IN THE PRIMARY ALUMINUM INDUSTRY. VOLUME I. SECTIONS 1 THROUGH 10.
23 Jul 73, 324p* EPA-450/3-73-004a
Contract CPA-70-21
See also Volume 2, PB-224 283.

Descriptors: (*Aluminum industry, *Air pollution control equipment), (*Air pollution, Aluminum industry), Economic analysis, Effluents, Industrial wastes, Growth, Production, Statistics, Gas sampling, Scrubbers, Expenses, Electrostatic precipitators.
Identifiers: Air pollution abatement, Air pollution economics.

A study was made of the technical and economic aspects of the emissions and control of air pollutants in the primary aluminum industry. The cost and performance data base for the study included detailed information supplied by the domestic producers, typical performance data obtained from equipment suppliers, and published information from the technical literature. Engineering analysis of the data resulted in systems evaluation of current industry control in terms of present costs and performance. Systems analysis was applied to growth projections at various control levels to estimate future costs and emissions. Recommendations were made covering the direction of research and development efforts towards improvement in pollution abatement by the industry. (Modified author abstract)

PB-224 283/2GA PC$5.75/MF$1.45
Singmaster and Breyer, New York.
AIR POLLUTION CONTROL IN THE PRIMARY ALUMINUM INDUSTRY. VOLUME II. APPENDICES.
23 Jul 73, 246p* EPA-450/3-73-004b
Contract CPA-70-21
See also Volume 1, PB-224 282.

Descriptors: (*Aluminum industry, *Air pollution control equipment), (*Air pollution, Aluminum industry), Questionnaires, Economic analysis, Effluents, Industrial wastes, Growth, Production, Statistics, Gas sampling, Scrubbers, Expenses, Electrostatic precipitators.
Identifiers: Air pollution abatement, Air pollution economics.

Contents: Data Acquisition Questionnaire; Particle Size Weight Distribution; Fractional Removal Efficiency Curves; Sampling and Analytical Technique; Determination of Total Fluoride Emissions; EPA Source Sampling; Emission Flow Diagrams; Removal Equipment Purchase Costs; and Sample Calculation of Industry Control Improvement Costs.

PB-224 315/2GA PC$3.25/MF$1.45
Tampa Bay Regional Planning Council, St. Petersburg, Fla.
PROGRAM COMPLETION REPORT/1972-73: INTERNATIONAL PROGRAM PLANNING AND COORDINATION.
Apr 73, 24p LPA-73-7-CP-5
Prepared in cooperation with Dunedin City Dept. of Planning, Fla.

Descriptors: (*Urban planning, *Florida), Community development, Objectives, Inventories, Financing, Project planning, Reviews.
Identifiers: *Dunedin(Florida).

The report serves both as a summary of the work accomplished, additional work contemplated, and materials produced in connection with work elements nos. one through four of the 1972-73 Dunedin, FL comprehensive planning program and as a published status report for work element no. five, intergovernmental program planning and coordination.

PB-224 316/0GA PC$13.75/MF$1.45
Southwest Research Inst., San Antonio, Tex. Dept. of Automotive Research.
IN-USE HEAVY DUTY GASOLINE TRUCK EMISSIONS. PART I. MASS EMISSIONS FROM TRUCKS OPERATED OVER A ROAD COURSE.
Final rept.,
Melvin N. Ingalls, and Karl J. Springer. Feb 73, 233p SwRI-AR-874 EPA-460/3-73-002a
Contract EPA-70-113

Descriptors: (*Air pollution, Exhaust gases), (*Trucks, *Exhaust gases), Exhaust emissions, Fuels, Cargo vehicles, Hydrocarbons, Carbon monoxide, Carbon dioxide, Nitrogen oxides, Field tests, Measurement, Dynamometers, Impact, Sampling.

Mass emission tests were run on a number of gasoline powered trucks above 6,000-lb GVW during road driving and chassis dynamometer operation. A constant volume sampler was used to obtain samples during operation on a 7.24 mile course in San Antonio and during the entire 20 minute nine-mode FTP. The agreement between the road and dynamometer results, in terms of grams of emission per pound of fuel, was used to determine what road emissions would be from a larger, 145 vehicle, fleet that was subjected to similar CVS nine-mode FTP tests in the laboratory. Consideration of the end use of the data was made with preliminary expressions developed for possible use in determining the contribution of gasoline HDVs to air pollution. Data was provided to assist in better estimating national impact from this source. A group of 25 trucks representing a variety of makes, displacements and gross vehicle weights were studied and extensive road and dynamometer hydrocarbon, carbon monoxide and oxides of nitrogen emission data are included. Also included are percent of time at various increments of engine speed and manifold vacuum and vehicle speed that define how each truck operated in traffic over the road course. (Author)

PB-224 322/8GA PC$4.75/MF$1.45
Alabama Univ., University. Natural Resources Center.
LEGISLATIVE FRAMEWORK FOR WATER RESOURCES MANAGEMENT IN ALABAMA.
Final rept.,
Harry Cohen, and David M. Grubbs. Mar 73, 52p
ALA-NRC-X996-WRC-73, ALA-NRC-722
Prepared in cooperation with Alabama Development Office, Montgomery.

Descriptors: (*Water resources, *Management), (*Legislation, *Alabama), Water rights, Organizations, Regional planning, State government, Project planning, Surface waters, Ground water, Utilization.

The study proposes a framework for management of Alabama's water resources in the form of a

legislative act creating an Alabama water resources commission as the agency responsible for comprehensive statewide water resources planning and delegating to the agency authority to administer a program for permissive withdrawal and use of the state's surface and ground waters.

PB-224 329/3GA MF$1.45
New Bedford Redevelopment Authority, Mass.
PRESERVATION AND REHABILITATION OF A HISTORIC COMMERCIAL AREA.
Final rept. Sep 65-Mar 67.
1973, 134p
Available in microfiche only.

Descriptors: (*Urban planning, *Massachusetts), (*Urban renewal, Blighted areas), History, Commercial buildings, Industrial buildings, Architecture, Structural design, Benefit cost analysis, Standards, Economic analysis, Feasibility.
Identifiers: *New Bedford(Massachusetts).

The report presents the results of a study conducted in New Bedford, Massachusetts, which began in the fall of 1965 dealing with the problems related to the preservation and rehabilitation of a historic area of the community which had traditionally been used to support commercial and industrial activities. The case area in New Bedford was the Waterfront Historic District, the locus of New Bedford's 19th century whaling industry and related commercial and industrial activities. Contents of the report include techniques of: building and area analysis; economic analysis of fair value for reuse of deteriorated and obsolete structures of historic and architectural merit; establishing relative priorities for historic and architectural preservation; establishing property rehabilitation standards for buildings of historic and architectural merit; civic design controls; and benefit/cost analysis of the feasibility of the use of title I urban renewal activities to implement preservation and rehabilitation activities in a historic commercial area.

PB-224 340/0GA PC$7.75/MF$1.45
South Central Alabama Development Commission, Montgomery.
LAND DEVELOPMENT PLAN, GREENVILLE, ALABAMA.
Final rept.
Jun 73, 114p ALA-SCA-0790-1020-01

Descriptors: (*Urban planning, *Alabama), Land use, Traffic engineering, Urban transportation, Services, Education, Social welfare, Parks, Recreational facilities, Public health.
Identifiers: *Greenville(Alabama).

The study contains the results of a survey, inventory and analysis of existing land use, and land development patterns, in and around the city of Greenville, AL. It sets forth a plan for future development and an improved system for facilitating traffic. (Author)

PB-224 352/5GA PC$5.25/MF$1.45
Tampa Bay Regional Planning Council, St. Petersburg, Fla.
CAPITAL IMPROVEMENT BUDGET AND PROGRAM FOR PASCO COUNTY, FLORIDA 1973-74 THROUGH 1977-78.
Final rept.
May 73, 61p LPA-73-9-MC-7
Prepared in cooperation with Pasco County Planning Department.

Descriptors: (*Regional planning, *Florida), Budgeting, Expenses, Project planning, Assessments, Public works, Parks, Recreation, Capital.
Identifiers: *Pasco County(Florida).

The capital improvement budget and program represents the county's program of anticipated major expenditures and projects needed by the community over the next five year period. It establishes a system of priorities and states the method of financing and scheduling. Portions of this document are not fully legible.

PB-224 353/3GA PC$3.25/MF$1.45
Tampa Bay Regional Planning Council, St. Petersburg, Fla.
INSTRUCTION MANUAL FOR PREPARATION OF THE SIX-YEAR CAPITAL IMPROVEMENT PROGRAM, CITY OF DUNEDIN, FLORIDA.
Final rept.
Apr 73, 25p LPA-9-MC-5-Pt-1
Prepared by the Wilbur Smith and Associates. See also report dated Jun 73, PB-224 354.

Descriptors: (*Urban planning, *Florida), Finance, Expenses, Project planning, Local government, Instructions, Manuals.
Identifiers: Dunedin(Florida).

The manual was prepared to assist all agencies, under the control of the city council of Dunedin, FL that wish to submit a capital project. Project definitions, procedures for submission, form definitions, and complation instructions and the general program definition are all outlined in the manual. (Author) Portions of this document are not fully legible.

PB-224 354/1GA PC$4.25/MF$1.45
Tampa Bay Regional Planning Council, St. Petersburg, Fla.
SIX YEAR CAPITAL IMPROVEMENTS PROGRAM. PART II. CITY OF DUNEDIN, FLORIDA.
Final rept.
Jun 73, 43p LPA-73-9-MC-5-Pt-2
Prepared by the Wilber Smith and Associates. See also report dated Jun 73, PB-244 353.

Descriptors: (*Urban planning, *Florida), Fiscal policies, Revenue, Expenses, Budgeting, Project planning, Financing, Capital.
Identifiers: *Dunedin(Florida).

Part II of the capital improvements program for Dunedin, FL identifies needed public improvements, assigns relative priority to each and develops a fiscal plan to accomplish and improvements. (Modified author abstract)

PB-224 355/8GA PC$5.25/MF$1.45
Tampa Bay Regional Planning Council, St. Petersburg, Fla.
SURVEY AND ANALYSIS OF SUBSTANDARD HOUSING AND RELATED PROBLEMS.
Final rept.
Jun 73, 62p LPA-73-4-HG-5
Prepared in cooperation with the Pasco County Planning Dept., Fla.

Descriptors: (*Regional planning, *Florida), (*Residential buildings, Regional planning), Blighted areas, Recommendations, Standards, Objectives, Economic factors, Marketing, Tables(Data).
Identifiers: *Pasco County(Florida).

The survey and analysis of substandard housing and related problems presents an overview of the housing associated problems, and along with statements on housing problems, obstacles, objectives, and planning activities and recommendations for the Pasco County, FL planning department. Tables are included which reflect the results of the survey of substandard housing in ten target areas.

PB-224 379/8GA PC$3.00/MF$1.45
Colorado Div. of Highways, Denver. Planning and Research Div.
NOISE LEVELS ASSOCIATED WITH PLANT MIX SEALS.
Final rept.,
Lowell B. Steere. May 73, 46p CDOH-P/R-R/SS-73-3 FHWA-RD-73-50

Descriptors: (*Pavements, Noise(Sound)), Tires, Concrete pavements, Flexible pavements, Bituminous coatings, Texture, Field tests, Colorado.

Field testing was performed on Colorado highways on open graded plant mix seals, dense graded bituminous pavement, and Portland cement concrete. The data developed by these tests show that a motor vehicle traveling at 45 mph produces less noise on open graded plant mix seal coats, as a group, than on other types of pavement. Traffic noise measured at 25 feet from the moving vehicle is significantly lower for the more open graded Colorado Type A than for any other pavement tested.

PB-224 380/6GA PC$6.75/MF$1.45
Mid-Ohio Regional Planning Commission, Columbus.
REGIONAL HOUSING STUDY: MID-OHIO. REPORT 2.
Final rept.,
William C. Habig, G. M. Ayya, Bruce Burns, and Annelle Porter. Feb 73, 94p CPA-OH-15-16-0307-2

Descriptors: (*Regional planning, *Ohio), (*Residential buildings, Regional planning), Income, Demography, Houses, Surveys, Demand(Economics), Supply(Economics).

The study is an identification of the quantitative and qualitative need for housing in the Mid-Ohio Region. It analyzes the income and demographic characteristics of the people and provides a complete overview of the number of houses needed both now and at intervals in the future. An analysis of the ability of the housing delivery system to provide the needed number of units with the specified characteristics is given. After aligning the need with that which will be supplied by the housing delivery mechanism, the housing deficiency is succinctly presented. This is the numerical need for housing now and in the future. Also, having taken into account the operation of the housing delivery system, the study offers efficient means to the solution of the housing problem in the Mid-Ohio Region. (Modified author abstract)

PB-224 382/2GA PC$8.00/MF$1.45
American Society of Planning Officials, Chicago, Ill.
EXAMPLE OF A METROPOLITAN OVERALL PROGRAM DESIGN. COMPREHENSIVE PLANNING ASSISTANCE PROGRAM.
Final rept.
Oct 72, 117p

Descriptors: (*Urban planning, *Manuals), (*Grants, Project planning), Local government, Reviews.
Identifiers: 701 assistance, Comprehensive planning assistance.

The report is designed to assist metropolitan planning organizations applying for 701 Assistance to develop overall program designs which meet their own management needs, as well as HUD's program requirements. The overall program design is a tool by which public officials and their staffs can organize and direct their planning and management activities, whether HUD assisted or not. This document is an example, with explanatory comments, of an overall program design for an applicant representing a metropolitan area. The Introduction to the report describes the requirements for a 701 application.

PB-224 426/7GA PC$5.00/MF$1.45
Alabama Development Office, Mongomery.
APPLICATION OF STREAM WATER QUALITY MODELS TO ALABAMA.
Final rept.,
Joe Morgan, Lansford Bell, and Brian Rindt. Jun 73, 57p ALA-AU-X996-WRC-a
Prepared in cooperation with Auburn Univ., Ala. Dept. of Civil Engineering.

Descriptors: (*Water quality, Mathematical models), (*Alabama, Water quality), Stream flow, Sougahatchee Creek basin, Evaluation, Water pollution, Steady state.

Two steady-state, uniform flow stream water quality prediction models, DOSAG and STREM, were applied to the Upper Sougahatchee Creek Basin near Auburn, Alabama. The models were verified and then used to forecast conditions that would occur during periods of very low flow. Results indicated that either model could be of immediate use in forecasting stream water quality in Alabama given the constraints of minimal model and computational sophistication. The development of a more complex system of models was recommended for future use. (Author)

PB-224 429/1GA MF$1.45
National Academy of Engineering, Washington, D.C.
TRANSPORTATION AND THE PROSPECTS FOR IMPROVED EFFICIENCY.
Jul 73, 268p*
International Standard Book No. 0-309-02120-0. A Symposium Sponsored by the National Science Foundation, Dept. of Housing and Urban Development, Department of Transportation, and National Academy of Engineering at its Eighth Meeting October 12 and 13, 1972.
Paper copy available from National Academy of Engineering $7.00.

Descriptors: (*Transportation, Meetings), Research, Urban transportation, Urban development, Urban renewal, Air transportation, Short takeoff aircraft, Marine transportation, Cargo transportation, California, Texas, Illinois, New York, District of Columbia.

The proceedings present the views of experts from government, industry, and the academic community as they seek to identify urban transportation problems and related modal interface problems; to describe the relationship of urban transportation to urban development, design, and renewal; and to point out institutional barriers that impede progress in urban transportation. The proceedings also concern different approaches to urban transportation and urban development that have been used successfully in various municipal areas, including Dallas, Chicago, San Francisco, and Washington, D.C.

PB-224 430/9GA MF$1.45-NTIS
Highway Research Board, Washington, D.C.
PHOTOGRAMMETRIC ANALYSIS OF URBAN AND RURAL ENVIRONMENTS,
W. N. Melhorn. 1973, 71p* HRB-Record-452
7 Reports prepared for the Annual Meeting (52nd) of the Highway Research Board, Jan 73. Library of Congress Catalog Card No. 73-15101. International Standard Book No. ISBN 0-309-02184-7.
Paper copy available from National Academy of Sciences. 2101 Constitution Ave., N.W., Washington, D.C. 20418. $2.20.

Descriptors: (*Highway planning, *Photogrammetry), Urban areas, Rural areas, Remote sensing, Aerial surveys, Environmental surveys, Esthetics, Soil classification.

Contents:
- Landscape aesthetics numerically determined: applications to highway corridor selection;
- Application of aerial mapping to development of highways;
- Environmental criteria for recreationally oriented highway planning;
- remote-sensing applications to environmental analysis;
- Semiautomated large-scale mapping;
- Measuring and depicting trouble areas in stereomodels;
- Aerial surveys for highways in North America.

PB-224 431/7GA PC$7.25/MF$1.45
Tennessee State Planning Office, Chattanooga. Southeast Tennessee Section.
INDUSTRIAL SITE SURVEY FOR POLK COUNTY.
Final rept.,
J. T. Qualls, Martin Kell, J. R. McNelley, Charlie Presswood, and Dennis White. Jun 73, 105p TN-POLC-73-1006
Prepared in cooperation with Polk County Regional Planning Commission, Tenn.

Descriptors: (*Industrial readiness, *Site surveys), (*Regional planning, *Tennessee), Reviews, Industrial relations, Economic development, Factor analysis, Project planning, Constraints, Recommendations.
Identifiers: *Polk County(Tennessee).

The report is a survey of 16 selected sites in Polk County, TN, designated as potential industrial areas. The study seeks to detail the numerous variables involved in industrial development. The relationship of existing facilities available for industry compared to needed facilities needs improvement in Polk County. Also, the difference between the present state of industrial preparation and a well-planned, efficiently administered program of industrial development is serious, a condition which should be considered deeply before major commitments are made.

PB-224 435/8GA PC$10.75/MF$1.45
Tennessee State Planning Office, Knoxville. East Tennessee Section.
COMPREHENSIVE PLAN, SEVIERVILLE, TENNESSEE, 1973-1993.
Final rept.
Jul 73, 174p TN-SEVE-73-1006
Prepared in cooperation with Sevierville Regional Planning Commission, Tenn.

Descriptors: (*Urban planning, *Tennessee), Land use, Inventories, Population growth, Urban transportation, Public buildings, Services, Public health, Safety, Recreation, Residential buildings, Public utilities.
Identifiers: Sevierville(Tennessee).

The report contains an analysis of factors which have influenced the growth and development of the city of Sevierville and its surrounding region, and those which will influence its future growth. Based on this analysis and population projections for 1990, a comprehensive plan has been prepared in accordance with the adopted community goals. This comprehensive plan consists of a land use survey, analysis, and plan, a transportation analysis and plan, a community facilities inventory, analysis and plan, public improvements program, and plan implementation.

PB-224 436/6GA PC$6.50/MF$1.45
Environmental Protection Agency, Cincinnati, Ohio. Office of Water Program Operations.
BIOASSAY DILUTER CONSTRUCTION TRAINING MANUAL,
Herbert W. Jackson. Jun 73, 90p EPA-430/1-73-007

Descriptors: (*Laboratory equipment, Bioassay), Manuals, Dilution, Bioinstrumentation, Fabrication.

This manual is designed to supplement tutorial instruction and published literature describing the design and construction of various types of flow-through bioassay and biomonitoring equipment. Illustrations, tables of design values, list of materials needed, and reprints of significant publications from technical journals are included. (Modified author abstract)

PB-224 440/8GA PC$3.50/MF$1.45
Tennessee State Planning Office, Jackson. West Tennessee Section.
PUBLIC ADMINISTRATION STUDY FOR UNION CITY, TENNESSEE.
Final rept.
Jun 73, 30p TN-UNIC-73-1006
Prepared in cooperation with the Union City Regional Planning Commission, Tenn.

Descriptors: (*Local government, Appraisals), (*Public administration, *Tennessee), Surveys, Reviews, Forecasting, Abilities, Problem solving, Urban planning, Services, Demand(Economics), Organizations, Leadership.
Identifiers: *Union City(Tennessee).

The study is made to determine whether the existing government, boards, commissioners, authorities, and other agencies are capable of meeting the future demads for public services in Union City, Tennessee, and of solving the problems of the future.

PB-224 448/1GA PC$3.00/MF$1.45
Spartanburg County Planning and Development Commission, S.C.
INITIAL RECONNAISSANCE SURVEY FOR THE TOWN OF CHESNEE, SPARTANBURG COUNTY, SOUTH CAROLINA.
Mar 73, 10p SC-40-0014-0742

Descriptors: (*Urban planning, *South Carolina), Population growth, Recommendations, Central city, Project planning, Urban transportation, Residential buildings, Public utilities, Revenue.
Identifiers: *Chesnee(South Carolina).

The report is a standard reconnaissance survey conducted in accordance with HUD 701 requirements and designed to identify the problems and needs of Chesnee, S.C.

PB-224 449/9GA PC$3.50/MF$1.45
New Mexico State Univ., University Park. Water Resources Research Inst.
THE QUEST FOR WATER IN NEW MEXICO.
Technical completion rept.,
Paige W. Christiansen. Aug 73, 71p WRRI-029 OWRR-00006, OWRR-A-026-NMEX(1)
Prepared in cooperation with New Mexico Inst. of Mining and Technology, Socorro.

Descriptors: (*History, *New Mexico), (*Water resources, New Mexico), Water supply, Irrigation, Anthropology.

This study assembled historical data relating to water control and applied technology during Indian, Spanish, and Anglo-American periods in New Mexico. In addition, historic forces, such as law, social institutions, economic habits, irrigation practices, and transportation, affecting the development of water resources are laid out and evaluated, thereby giving a comparison of efforts ad applications across the three major cultures making up New Mexico's historical pattern. (Modified author abstract)

PB-224 450/7GA PC$3.50/MF$1.45
New Mexico State Univ., University Park. Water Resources Research Inst.
CHEMICAL AND BIOLOGICAL CHARACTER OF RIO GRANDE WATER IN THE BOSQUE DEL APACHE WILDLIFE REFUGE.
Technical completion rept.,
Donald K. Brandvold, James A. Brierley, and Carl J. Popp. Aug 73, 59p WRRI-030 W74-00007, OWRR-A-038-NMEX(2)
Prepared in cooperation with New Mexico Inst. of Mining and Technology, Socorro.

Descriptors: (*Water quality, *Environmental surveys), New Mexico, Public land, Water analysis, Wildlife, Rio Grande River, Water chemistry, Bioassay, Birds.
Identifiers: *Bosque del Apache Wildlife Refuge, Socorro County(New Mexico).

The project purpose was to study the effects of a waterfowl refuge on water quality monitoring the physical, chemical, and biological character of the water in the Bosque del Apache Wildlife Refuge along the Rio Grande in Socorro County, New Mexico. A regular monthly monitoring program over the three-year study period was set up to collect and analyze water samples from eight points within the refuge. The types of water monitored were as follows; water entering the refuge, water leaving the refuge, Rio Grande water within the refuge which served as a control since it was not used in refuge management, swamp water, irrigation water, fishing pond water, and high-water-fowl-use temporary ponds. (Modified author abstract)

PB-224 451/5GA PC$6.50/MF$1.45
Tennessee State Planning Office, Nashville. Middle Tennessee Section.
ZONING ORDINANCE, NEW JOHNSONVILLE, TENNESSEE.
Sep 73, 90p TN-NEWJ-72-1006-2

Descriptors: (*Urban planning, *Tennessee), (*Land use zoning, ordinances), Boundaries, Land use, Law enforcement, Residential buildings, Commercial buildings, Industrial buildings, Agriculture.
Identifiers: *New Johnsonville(Tennessee).

The zoning ordinance for New Johnsonville, TN divides the city into eleven districts for the purpose of regulation the land use and buildings. A list of definitions of terms is included. General provisions which affect all districts are enumerated. Exceptions, modifications, enforcement and the administration of the zoning ordinance by the board of zoning appeals are covered in appropriate depth. The ammending process, legal status and validity of the ordinance are explained.

PB-224 452/3GA PC$4.25/MF$1.45
Interstate Electronics Corp., Anaheim, Calif. Oceanics Div.
BIBLIOGRAPHY ON OCEAN WASTE DISPOSAL.
May 73, 114p IEC-4460C101542
Contract EPA-68-01-0796

Descriptors: (*Water pollution, *Oceans), (*Bibliographies, Water pollution), (*Solid waste disposal, Oceans).
Identifiers: *Ocean waste disposal.

This research bibliography is restricted to documents relevant to the field of ocean waste disposal. It is primarialy limited to recent publications, with emphasis on those published between January 1968 through April 1973. (Author)

PB-224 456/4GA PC-GPO/MF$1.45-NTIS
General Electric Co., Philadelphia, Pa. Re-entry and Environmental Systems Div.
PRESSURE SEWER DEMONSTRATION AT THE BOROUGH OF PHOENIXVILLE, PENNSYLVANIA.
Environmental protection technology series,
George Mekosh, and Daniel Ramos. Jul 73, 71p W74-00153, EPA-R2-73-270
Paper copy available from GPO $1.00 as EP1.23/2:73-270.

Descriptors: (*Sewers, Pressurization), (*Sewage pumps, Residential buildings), Operations research, Performance evaluation, Sewage disposal, Waste water, Maintenance, Cost analysis, Water analysis, Installing, Plastic pipes, Pennsylvania.
Identifiers: *Pressure sewers, Grinder pumps, Phoenixville(Pennsylvania).

A site was selected at the Borough of Phoenixville, Pennsylvania, which provided a maximum variable exercise of a pressure sewer system. The project proved over a six-month period that a multiple residence pressure sewer system can adequately store peak loads of wastewater and grind and pump wastewater through small-diameter plastic pipe to the existing conventional gravity sewer. During the project, data was collected which provided information concerning the installation, operation and maintenance of the system, its technical performance, the variations in that performance during the six-month period and the characteristics of the wastewater as delivered to the existing gravity sewer.

PB-224 457/2GA PC$5.25/MF$1.45
Association of Bay Area Governments, Berkeley, Calif.
FEDERAL GRANT-IN-AID EXPENDITURES IN THE 1970'S: SOME IMPLICATIONS TO LOCAL GOVERNMENTS IN THE SAN FRANCISCO BAY AREA.
Final technical rept. Mar 72-Jan 73,
Stephen Levy, and Robert K. Arnold. Nov 72, 61p ABAG-1007-1.8-2
Prepared by Center for the Continuing Study of the California Economy, Palo Alto, Calif.

Descriptors: (*Federal budgets, *California), (*Local government, *Project planning), Regional planning, Constraints, Trends, Revisions, Forecasting, Legislation.
Identifiers: San Francisco Bay area, Revenue sharing, Possibilities.

A technical report summarizes major trends in federal grant-in-aid programs and expenditures for the 1970's and discusses some of the major implications for local governments in the San Francisco Bay area. The possibility of a fiscal bind at the federal level over the next five years is discussed. The recently enacted revenue sharing and water pollution control acts are reviewed and discussed. Proposed changes in the structure and focus of many grant-in-aid programs are set forth.

PB-224 459/8GA PC$3.50/MF$1.45
Interstate Electronics Corp., Anaheim, Calif. Oceanics Div.
DIRECTORY OF MANAGERS, ENGINEERS AND SCIENTISTS IN OCEAN WASTE DISPOSAL AND RELATED ENVIRONMENTAL SCIENCE FIELDS,
C. T. Tucker, and R. J. Marmolejo. Jun 73, 73p* IEC-4460C1543
Contract EPA-68-01-0796

Descriptors: (*Water pollution, *Professional personnel), (*Oceans, Water pollution), Directories.
Identifiers: *Ocean waste disposal.

This directory was compiled by the Oceanics Division of Interstate Electronics Corporation while performing research and field surveys on ocean waste disposal. The purpose of the directory is to facilitate communication between managers, engineers and scientists working in the field of ocean waste disposal and related environmental sciences. (Modified author abstract)

PB-224 460/6GA PC$7.75/MF$1.45
Association of Bay Area Governments, Berkeley, Calif.
ESTIMATES OF LOCAL GOVERNMENT EXPENDITURES IN THE SAN FRANCISCO BAY AREA IN THE 1960'S WITH PROJECTIONS TO 1975 AND 1980.
Final technical rept. Mar 72-Jan 73,
Janet Lungren, Robert K. Arnold, and Stephen Levy. Jan 73, 115p ABAG-1007-1.8-4
Prepared by Center for the Continuing Study of the California Economy, Palo Alto, Calif.

Descriptors: (*Local government, *Finance), (*Regional planning, *California), Expenses, Estimates, Economic forecasting, Classifications, Statistical data, Comparison, United States, Factor analysis.
Identifiers: San Francisco Bay area, Local government expenditures, Counties.

The report contains in tables and charts estimates of direct general expenditures classified by the U.S. Bureau of the Census functional categories for the nine county San Francisco Bay Area by individual counties for the years 1962, 1964-65 to 1969-70. The estimates allow staff and local officials to compare the expenditures in their own jurisdictions with other jurisdictions in the San Francisco Bay area as well as in the state of California and in the total United States. The report also contains projections to 1975 and 1980.

PB-224 461/4GA PC$5.00/MF$1.45
Tennessee State Planning Commission, Nashville. Middle Tennessee Office.
MUNICIPAL ZONING ORDINANCE, CENTERVILLE, TENNESSEE.
Sep 73, 56p TN-CENE-4-71-129-5

Descriptors: (*Urban planning, *Tennessee), (*Land use zoning, Urban planning), Regulations, Boundaries, Legislation, Licenses, Residential buildings, Commercial buildings, Industrial buildings, Streets, Right of way acquisition.
Identifiers: *Centerville(Tennessee).

Purpose of the zoning regulations and districts and statement of compliance with the Tennessee enabling legislation is discussed. A list of definitions of terms is included. General provisions which affect all districts are enumerated. The various districts are defined and the various uses and structures permitted in each district are discussed, along with prohibited uses and structures, and minimum space requirements and other developmental standards. Exceptions, modifications, enforcement and the administration of the zoning ordinance by the board of zoning appeals are covered in appropriate depth. The ammending process, legal status and validity of the ordinance are explained.

PB-224 463/0GA PC$4.50/MF$1.45
South Carolina Administration Div., Columbia.
ANNEXATION STUDY, DARLINGTON, SOUTH CAROLINA.
Jun 73, 46p SC-40-0014-0581
Prepared by Thomas C. Hammond, Planning Consultant, Florence, S.C.

Descriptors: (*Urban planning, *South Carolina), Boundaries, Law(Jurisprudence), Municipalities, Policies, Recommendations, Financing.
Identifiers: *Darlington(South Carolina).

The study evaluates the feasibility of annexing the developed areas on the fringe of the city of Darlington, SC. The fringe area was divided into study areas and each area analyzed as to its tax base as opposed to its service requirements. Recommendations are made on the sequence and priorities of implementation and suggestions offered for the development of a sound annexation policy for the future. (Author)

PB-224 467/1GA PC-GPO/MF$1.45-NTIS
Pennsylvania State Univ., University Park. Dept. of Agronomy.
NITRATE AND NITRITE VOLATILIZATION BY MICROORGANISMS IN LABORATORY EXPERIMENTS,
Jean-Marc Bollag. Aug 73, 72p W74-00008, EPA-660/2-73-002
Paper copy available from GPO $1.00 as EP1.23:660-73-002.

Descriptors: (*Nitrogen inorganic compounds, *Biodeterioration), Inorganic nitrates, Nitrites, Microorganisms, Chemical removal(Sewage treatment), Soil microbiology, Vaporizing, Bacteria, Fungi, Process variables, Methane.
Identifiers: *Denitrification, Water pollution control.

Microbial nitrate and nitrite volatilization was considered as a means to eliminate nitrogen from soil and water in order to inhibit the accumulation of

nitrogenous substances as pollutants or health hazardous compounds. Therefore it was attempted to compare nitrate reducing microorganisms in their reactions to different environmental conditions in laboratory experiments. Changing oxygen concentration, pH, temperature, nitrate or nitrite concentration affected differently the denitrification process of various isolated microorganisms. Biological and chemical factors were evaluated during nitrite transformation in autoclaved and non-autoclaved soil by determination of the evolvement of nitrogenous gases. During chemical nitrite volatilization, which occurred essentially at a low pH, the major gases evolved were nitric oxide and nitrogen dioxide, but if biological activity was predominant in a neutral and alkaline environment, nitrous oxide and molecular nitrogen were formed. The validity of laboratory observations in relation to field studies in the domain of denitrification is discussed and evaluated. (Modified author abstract)

PB-224 471/3GA PC$3.00/MF$1.45
Spartanburg County Planning and Development Commission, S.C.
INITIAL RECONNAISSANCE SURVEY FOR THE TOWN OF LANDRUM, SPARTANBURG COUNTY, SOUTH CAROLINA.
May 73, 12p SC-40-0014-0743

Descriptors: (*Urban planning, *South Carolina), Population growth, Recommendations, Central city, Project planning, Residential buildings, Urban transportation, Finance.
Identifiers: *Landrum(South Carolina).

The report describes a standard reconnaissance survey conducted in accordance with HUD 701 requirements and designed to identify the problems and needs of Landrum, SC.

PB-224 472/1GA PC$8.00/MF$1.45
New York State Office of Planning Services, Albany.
PLANNING AND REDEVELOPMENT PROGRAM, PART I. VILLAGE OF PAINTED POST, NEW YORK.
Final rept.
Jun 73, 20p

Descriptors: (*Regional planning, *New York), Community development, Urban renewal, Building codes, Law enforcement, Residential buildings, Financing, Relocation, Floods.
Identifiers: *Painted Post(New York).

The report is the first of two parts of the village's planning and redevelopment program. The report contains material prepared for the village of Painted Post, New York in order to meet federal urban renewal certification requirements. The information presented is a background analysis of existing conditions and problems and is used as a basis for the workable program. It includes the following specific studies: Codes and ordinances; neighborhood analysis; administrative organization; financing; and housing for displaced families. (Modified author abstract)

PB-224 473/9GA PC$6.25/MF$1.45
Waccamaw Regional Planning and Development, Council, Georgetown, S.C.
AN ENVIRONMENTAL, HISTORICAL AND RECREATIONAL ATLAS OF THE WACCAMAW REGION.
Sep 73, 84p SC-04-0014-0653

Descriptors: (*Regional planning, *South Carolina), Resources, Site surveys, Recreational facilities, Environmental surveys, History, Maps.
Identifiers: Georgetown County(South Carolina), Horry County(South Carolina), Williamsburg County(South Carolina).

The report provides a general description of historical, recreational and environmental sites within the Waccamaw Region, SC and locates each of these sites on a map. (Author)

PB-224 476/2GA PC-GPO/MF$1.45-NTIS
Kansas State Univ., Manhattan. Dept. of Civil Engineering.
PILOT PLANT DEMONSTRATION OF A LIME-BIOLOGICAL TREATMENT PHOSPHORUS REMOVAL METHOD,
Lawrence Schmid. Jun 73, 59p W74-00155, EPA-R2-73-159
Paper copy available from GPO $0.85 as EP1.23/2:73-159 and EPA-R2-73-159.

Descriptors: (*Chemical removal(Sewage treatment), *Phosphorus), Pilot plants, Sewage treatment, Activated sludge process, Performance evaluation, Process charting, Calcium oxides, Precipitation(Chemistry), Coagulation, PH, Biochemical oxygen demand.
Identifiers: Water pollution control.

A 15,000 gpd pilot plant was constructed to demonstrate the capabilities of a lime treatment process for phosphorus removal. The lime treatment of raw wastewater removes the bulk of the phosphorus, and a subsequent biological process removes an additional increment of phosphorus via cell synthesis. The pilot plant used for the study was a package-type, prefabricated unit. Additional small tanks were provided for sludge storage and measurement. A variable speed motor was mated to a program controller to duplicate a diurnal flow pattern through the pilot plant. Lime was introduced into the raw wastewater in response to an automated pH control system. Instrumented systems were also developed for turbidity and ortho-phosphate concentrations in the plant effluent. The raw wastewater entering the pilot plant was obtained from the wet well of the Manhattan, Kansas Municipal Plant. (Modified author abstract)

PB-224 477/0GA PC$6.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Ralph M. Parsons Lab. for Water Resources and Hydrodynamics.
METHODOLOGY FOR ASSESSING THE POTENTIAL IMPACT OF URBAN DEVELOPMENT ON URBAN RUNOFF AND THE RELATIVE EFFICIENCY OF RUNOFF CONTROL ALTERNATIVES,
Guy Leclerc, and John C. Schaake, Jr. Mar 73, 256p 167, R73-23 W74-00001, OWRR-C-2137(3403)(5)
Contract DI-14-31-0001-3403

Descriptors: (*Surface water runoff, *Urbanization), Urban areas, Methodology, Estimating, Stochastic processes, Rainfall, Computerized simulation, Watersheds, Fluid infiltration, Frequency distribution, Water storage.
Identifiers: *Urban hydrology, Storm water runoff.

A methodology was developed to assess the potential impact of urban development on urban runoff and to measure the relative efficiency of runoff control alternatives. The methodology utilizes runoff frequency curves, derived at different stages of development of the urban catchment. Comparisons of these curves completely quantify the impact of urban development and/or the efficiency of a control structure. Runoff frequency curves are derived directly from the rainfall process. The method of solution utilizes a stochastic model of the rainfall process and a deterministic model of the catchment. The method of solution, referred to as stochastic/deterministic simulation, incorporates the stochastic rainfall model, the deterministic catchment model, and results of the infiltration estimator. Results show that the solution procedure and the methodology developed are practical and are recommended for urban drainage analysis. (Modified author abstract)

PB-224 494/5GA PC-GPO/MF$1.45-NTIS
Envirotech Corp., Salt Lake City, Utah. Eimco Process Machinery Div.
PHYSICAL-CHEMICAL TREATMENT OF A MUNICIPAL WASTEWATER USING POWDERED CARBON.
Environmental protection technology series,
Donald E. Burns, and Gerald L. Shell. Aug 73, 237p W74-00154, EPA-R2-73-264
Contract EPA-14-12-585
Paper copy available from GPO $2.25 as stock no. EP1.23/2:73-264.

Descriptors: (*Chemical removal(Sewage treatment), *Sewage treatment), (*Activated carbon treatment, Sewage treatment), Pilot plants, Coagulation, Precipitation(Chemistry), Dewatering, Alums, Calcium oxides, Iron chlorides, Sludge disposal, Cost estimates, Polyelectrolytes, Vacuum filtration, Regeneration(Engineering).
Identifiers: *Physical chemical treatment, Water pollution control, Salt Lake City(Utah).

A municipal wastewater was treated in a nominal 100 gpm pilot plant by chemical coagulation-precipitation, powdered activated carbon adsorption and granular media filtration. Spent carbon was gravity thickened, vacuum filter dewatered and thermally regenerated in a fluidized bed furnace. Solids-contact units were used for chemical treatment and carbon contacting. Ferric chloride, alum or lime were all found to effectively produce coagulation and phosphorus insolubilization. Based on total treatment costs, including sludge disposal, alum treatment was estimated to be the economic choice for Salt Lake City municipal wastewater. Organic removal in the powdered carbon contactors was substantially enhanced by anaerobic biological activity. The use of solids-contact treatment units for carbon contacting resulted in effecting gravity clarification without the use of chemicals. The powdered carbon physical-chemical treatment system produced a treated effluent similar to that expected for biological treatment followed by tertiary treatment for phosphorus removal. Carbon losses of 17 to 60 percent were experienced across the fluidized bed furnace regeneration system. The cause of high carbon losses was identified as ignition of carbon instead of gas which was injected into the fluidized bed to scavenge excess oxygen. (Author)

PB-224 500/9GA PC$8.00/MF$1.45
Cornell Univ., Ithaca, N.Y. Water Resources and Marine Sciences Center.
STUDIES IN THE ANALYSIS OF METROPOLITAN WATER RESOURCE SYSTEMS. VOLUME VI. ESTIMATING ECONOMIES OF SCALE IN THERMAL ELECTRIC POWER SYSTEMS SUBJECTED TO ENVIRONMENTAL QUALITY CONSTRAINTS.
Technical rept.,
Charles R. Scherer. Aug 73, 395p TR-67 W74-00002, OWRR-C-3101(3684)(2)
Contract DI-14-31-0001-3684
See also Volume 5 dated Oct 72, PB-217 862.

Descriptors: (*Electric power generation, *Economic analysis), (*Water pollution, Electric power generation), Steam electric power generation, Cost estimates, Operating costs, Transmission loss, Electric power transmission, Air pollution, Benefit cost analysis, Electric power plants, Capitalized costs, Standards, Optimization, Mathematical models, Water pollution.
Identifiers: Economies of scale.

This study is concerned with the estimation of economies of scale in thermal-electric power systems subjected to water quality standards. The approach is engineering-economic. Mixed-integer programming is used to solve a mathematical model of a power system subject to constraints defining (1) the load duration curves of several demand centers located on a spatial grid or network, (2) endogenously determined reserves equal to the largest two generating units in the system, (3) nonlinear transmission losses, and (4) environmental

quality and emission standards. The objective of the model is to minimize the sum of total capital and operating costs for generation, transmission and abatement of pollution emissions. Fixed charges and piecewise linear functions are used to define costs exhibiting increasing returns to scale. The model is applied to a major part of the New York State Electric and Gas Corporation system. (Modified author abstract)

PB-224 507/4GA PC-GPO/MF$1.45-NTIS
Central Contra Costa Sanitary District, Walnut Creek, Calif.
PILOT-DEMONSTRATION PROJECT FOR INDUSTRIAL REUSE OF RENOVATED MUNICIPAL WASTEWATER.
Environmental protection technology series,
G. A. Horstkotte, Jr. Aug 73, 140p EPA-670/2-73-064, W73-00305
Paper copy available from GPO $1.55 as stock no. EP1.23:670-73-064.

Descriptors: (*Sewage treatment, Water reclamation), (*Cooling water, Water reclamation), (*Industrial water, *Water reclamation), Pilot plants, Cooling towers, Heat exchangers, Corrosion, Phosphorus, Scaling, Activated sludge process, Activated carbon treatment, California.
Identifiers: Physical chemical treatment, Tertiary sewage treatment.

Three pilot treatment sequences were operated during this study to produce various grades of effluent for subsequent testing as industrial water sources. The testing was conducted in pilot-sized test loops consisting of small cooling towers and heat exchangers. At the same time the renovated waters were tested, Contra Costa Canal water, which is presently used by industry in the study area, was also investigated in a test-loop identical to those used for the renovated water. The study results illustrated that the wastewater investigated can be treated satisfactorily for reuse in industrial applications. Corrosion rates and fouling factors observed with renovated water were equal to or less than found with the canal water. Precipitation of phosphorous was the major source of scale formation while using renovated water for cooling purposes, thus indicating the need for phosphorous removal. (Modified author abstract)

PB-224 519/9GA PC$3.75/MF$1.45
Spokane Metropolitan Area Transportation Study, Wash.
SUMMARY OF FINAL REPORT OF INITIAL TRANSPORTATION STUDY.
Dec 72, 93p
Sponsored in part by Federal Highway Administration. Washington, D.C.

Descriptors: (*Urban planning, *Washington(State)), (*Urban transportation, Urban planning), Mass transportation, Central city, Streets, Highways, Forecasting, Land use, Urbanization.
Identifiers: *Spokane(Washington).

The study's basic objective was to formulate a Transportation Plan as an integral element of the comprehensive plan of the metropolitan area. The transportation plan was to be developed to serve projected year 2000 travel, and was to include successive stages leading to the development of the longrange system. Various modes of transportation were considered in developing a balanced system of streets, highways and public transit facilities that will efficiently and effectively serve the metropolitan travel needs. Included in the study area was all land in the vicinity of the City of Spokane likely to be urbanized within the forecast period (1965-2000).

PB-224 532/2GA PC$16.00/MF$1.45
Texas Transportation Inst., College Station.
FEASIBILITY OF USING HIGHWAY LITTER IN HIGHWAY CONSTRUCTION AND MAINTENANCE.
Final rept.,
B. M. Gallaway. Dec 71, 278p FHWA-RD-72-47
Contract FH-11-7692
See also PB-224 685.

Descriptors: (*Wastes, *Reclamation), (*Pavements, Wastes), (*Solid waste disposal, *Materials recovery), Pollution, Earth fills, Feasibility, Incinerators, Aggregates, Economic analysis, Maintenance, Materials handling, Highways, Roads, Motor vehicles, Heat recovery, Texas.
Identifiers: Litter, Sanitary landfills.

The technical and economic feasibility of using highway litter in highway construction and maintenance was investigated. A research team gathered information and made technical and economic assessments of sixteen potential uses of highway litter. A major finding was that if highway litter is considered by itself none of the potential uses investigated would be economically feasible at the present time. In order to be economically feasible, highway litter should be combined with other solid wastes in order to provide either sufficient quantities or lower the unit cost of processing required. Other major findings were that six potential uses were assessed to be both technically and economically feasible, providing the litter is combined with other solid wastes. These six uses are landfill operations, aggregate replacement for base and subbase, aggregate replacement for stabilized materials, induced trench, vehicle impact attenuators, and maintenance materials. (Modified author abstract)

PB-224 533/0GA PC$8.25/MF$1.45
TRW Transportation and Environmental Operations, Redondo Beach, Calif.
TRANSPORTATION CONTROL STRATEGY DEVELOPMENT FOR THE METROPOLITAN LOS ANGELES REGION.
Final rept. 14 Aug-15 Dec 72,
Fred Winkler. Dec 72, 418p* APTD-1372
Contract EPA-68-02-0048

Descriptors: (*Air pollution, *Urban transportation), (*California, Air pollution), (*Transportation management, Air pollution), Exhaust gases, Urban areas, Strategy, Urban planning, Recommendations, Estimates, Periodic variations, Urban areas, Forecasting.
Identifiers: *Los Angeles(California), Air quality data, *Air pollution abatement, Automobile exhaust.

The document demonstrates the nature of the air quality problem attributed to motor vehicle operation, the magnitude of the problem, and a strategy developed to neutralize these effects in order that National Ambient air quality standards may be attained and maintained.

PB-224 535/5GA PC$4.90/MF$1.45
IGARUS Corp., Silver Spring, Md.
CAPITAL AND OPERATING COSTS OF POLLUTION CONTROL EQUIPMENT MODULES. VOLUME I, USER GUIDE,
Herbert G. Bleecker, and Theodore W. Cadman.
Jul 73, 265p* W74-00307, EPA-R5-73-023a
Contract EPA-68-01-0717
Paper copy also available from GPO $2.40 as EP1.23/3:73-023A. Paper copy also available from NTIS $8.00/set of 2 reports as PB-224 534-SET.

Descriptors: (*Air pollution control equipment, Cost estimates), (*Sanitary engineering, Cost estimates), Manuals, Capitalized costs, Operating costs, Interest rate of return, Sewage treatment, Industrial waste treatment.
Identifiers: *Air pollution control, *Water pollution control.

The User's Guide describes the scope of the cost manual on installation and operation of pollution control equipment modules. Illustrative examples are given enabling the user to prepare estimates of conceptual environmental protection processes using the companion Data Manual. Emphasis is placed upon the determination of the installed and annual costs of individual process equipment modules, determination of the installed and annual process costs, and evaluation of the potential process profitability in those cases where profit is a motive. (See also W74-00308) (Modified author abstract)

PB-224 536/3GA PC$3.90/MF$1.45
IGARUS Corp., Silver Spring, Md.
CAPITAL AND OPERATING COSTS OF POLLUTION CONTROL EQUIPMENT MODULES. VOLUME II, DATA MANUAL,
Herbert G. Blecker, and Thomas M. Nichols. Jul 73, 190p W74-00308, EPA-R5-73-023b
Contract EPA-68-01-0717
Paper copy also available from GPO $1.90 as EP1.23/3:73-023b. Paper copy also available from NTIS $8.00/set of 2 reports as PB-224 534-SET.

Descriptors: (*Air pollution control equipment, Cost estimates), (*Sanitary engineering, Cost estimates), Manuals, Data, Capitalized costs, Sewage treatment, Industrial waste treatment.
Identifiers: *Air pollution control, *Water pollution control.

This Data Manual presents, in convenient graphical and tabular form, cost information for installed equipment item modules on separate data sheets. Each data sheet conforms to a uniform style providing information on the specific item and adjustments to a typical installation, construction, or design. The methodology used in developing this data and the techniques suggested for its use are described in detail in the companion User Guide. (Author)

PB-224 549/6GA PC$5.25/MF$1.45
Siouxland Interstate Metropolitan Planning Council, Sioux City, Iowa.
1970 MODEL CHECK.
Technical memo.
20 Nov 72, 64p SIMPCO-22, SIMPCO-TM-570-15
Sponsored in part by Iowa State Highway Commission, Des Moines, Nebraska State Dept. of Roads, Lincoln, South Dakota Dept. of Highways, Pierre, and Federal Highway Administration, Washington, D.C.

Descriptors: (*Vehicular traffic, Mathematical models), (*Traffic surveys, Vehicular traffic), Forecasting, Socioeconomic status, Iowa, Urban transportation.

The traffic model check was made to determine if the models developed for the 1990 plan could be used for the 2000 plan. A comparison was made of the models using 1970 socio-economic data and the results of the models to 1970 ground counts. Trip generations and distributions were checked and adjusted slightly. Traffic assignment checks, screenline and cut line checks were also made. It was realized that a more extensive and coordinated traffic counting program is needed especially during the model check years. The results of the model check were positive with only minor improvements needed to use it for the 2000 plan.

PB-224 566/0GA PC$3.75/MF$1.45
Transport and Road Research Lab., Crowthorne (England).
ENVIRONMENTAL EFFECTS OF ALTON BYPASS,
R. F. F. Dawson. 1973, 32p TRRL-LR-589

Descriptors: (*Urban areas, *Bypasses), (*Traffic surveys, Public opinion), Acoustic measurement, Vehicular traffic, Questionnaires, Great Britain.
Identifiers: Noise pollution.

The Laboratory's first survey to examine the environmental effects of road building was carried out at Alton, Hants in 1971 and 1972. Alton is a town of about 10000 population situated on the A31 between Farnham and Winchester, to which a by-pass to the south of the town was opened in September 1971. The survey was in two parts: a 'before' carried out in July 1971 and an 'after' in July 1972. It consisted of noise measurements, traffic measurements and opinion questionnaires of residents, of shop and office workers and of pedestrians. The survey was based on the main road (A31) through Alton with two control areas, one in Alton away from the main road and the other at Bentley, a village on part of the A31 which is not affected by the by-pass. (Modified author abstract)

PB-224 572/8GA PC$8.00/MF$1.45
Environmental Protection Agency, Washington, D.C. Intergovernmental Relations Div.
COMPENDIUM OF STATE AIR POLLUTION CONTROL AGENCIES, 1972.
1 Sep 72, 376p* APTD-1556

Descriptors: (*Law(Jurisprudence), *Air pollution), Directories, Local government, State government, Regional geography, Abatement, Regulations, Statutes, Surveillance, Surveys.
Identifiers: Government agencies.

The document has been prepared to provide state and local governments, non-government entities and others in air pollution control programs with summaries of the statutory, organizational and functional means adopted by the states, territories and possessions of the United States to achieve environmental goals in the area of air pollution control. In format, the compendium follows the uniform configuration of the ten Federal regions. The compendium identifies the principal policy-making and regulatory organizations responsible for air pollution controlling each state, the District of Columbia, Guam, American Samoa, Puerto Rico and the Virgin Islands. The organizational structure of these agencies and their relationship to other state agencies are described diagrammatically. The offical state air pollution control agency with authority to accept and administer Federal funds and grants is identified. General statutory references to the States' basic air pollution control laws are proveded. In addition, specific references to particular powers and authorities are presented in tabular form.

PB-224 578/5GA PC$4.25/MF$1.45
Association of Bay Area Governments, Berkeley, Calif.
PROCEDURES FOR REGIONAL CLEARINGHOUSE REVIEW OF ENVIRONMENTAL IMPACT STATEMENTS.
Final rept.,
Jens C. Sorensen, and James E. Pepper. Oct 72, 124p* ABAG-1007-1.4
Revision of report dated May 72.

Descriptors: (*Environmental impact statements, Reviewing), Legislation, Instructions, Assessment, Information systems, Requirements, Government policies, Highways, Houses, Construction.
Identifiers: California Environmental Quality Act, National Environmental Policy Act.

The report presents a methodology for regional clearinghouse review of environmental impact statements as specified by the National Environmental Policy Act and/or the California Environmental Quality Act. Through network analysis the procedure systematically relates actions or activities of specified project-types to potential adverse environmental and socio-economic impacts. Two project-type review lists, housing and highways, have been developed and are appended to the report. In order to assess the actual degree and dimension of the impacts, the report outlines a process for relating the potential impacts identified by the project-type checklists to geographically mapped environmental and socio-economic conditions. The project checklists also specify public agencies with particular expertise and/or designated authority concerning the impacts identified. Portions of this document are not fully legible.

PB-224 580/1GA PC$5.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME I. SUMMARY REPORT.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 210p* TRW-21485-6013-RU-00-Vol-1 EPA-670/2-73-053-a
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Waste disposal, Hazardous materials), (*Pollution, *Hazardous materials), (*Materials handling, Hazardous materials), Solid waste disposal, Liquid waste disposal, Profiles, Criteria, Industrial wastes, Industrial waste treatment, Costs, Reclamation, Water pollution, Inventories, Air pollution, Management planning.
Identifiers: National Disposal Sites.

A summary of the work performed on the hazardous waste research project is presented in the first volume of the 16 volume report. The report includes an updated listing of hazardous waste stream constituents, an evaluation of the adequacy of current waste management practices for these materials, and an identification of the research and development required to provide necessary information or develop adequate treatment methods. The results of this study clearly indicate the requirement for a system of National Disposal Sites to provide a repository for certain classes of hazardous waste stream constituent residues which must be stored and monitored permanently to avoid harm to the public and/or the environment.

PB-224 581/9GA PC$5.75/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME II. TOXICOLOGIC SUMMARY.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, Gi. I. Gruber, and M. J. Santy. Aug 73, 244p* TRW-21485-6013-RU-00-Vol-2 EPA-670/2-73-053-b
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Pollution, *Hazardous materials), (*Toxicology, Hazardous materials), Water pollution, Air pollution, Industrial wastes, Standards, Solid waste disposal, Industrial wastes, Tables(Data), Toxicity, Health.
Identifiers: Permissible dosage.

This volume provides a summary of the toxicologic information and the recommended levels of exposure via the air, water, and soil for over 500 hazardous waste stream constituents under investigation. The recommended exposure standards were based on an evaluation of the published data on the toxicity of the hazardous waste stream constituents.

PB-224 582/7GA PC$6.25/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME III. DISPOSAL PROCESS DESCRIPTIONS. ULTIMATE DISPOSAL, INCINERATION, AND PYROLYSIS PROCESSES.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 251p TRW-21485-6013-RU-00-Vol-3 EPA-670/2-73-053-c
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Pollution, *Hazardous materials), (*Materials handling, Hazardous materials), (*Waste disposal, Hazardous materials), Radioactive waste processing, Solid waste disposal, Liquid waste disposal, Industrial wastes, Oceans, Industrial waste treatment, Incinerators, Sanitary landfills, Injection wells, Water pollution, Geology, Air pollution, Petroleum industry, Economics, Metal finishing, Pesticides, Metal industry, Costs, Design, Regulations.
Identifiers: Ocean waste disposal, Pyrolysis incineration, National disposal sites.

This volume provides descriptions of ultimate disposal processes, incineration, and pyrolysis processes currently used for the treatment or disposal of hazardous wastes. These descriptions detail the important features of each process and discuss their applicability to the various classes of waste materials. The ultimate disposal processes described in this volume include deep well disposal, land burial, landfill disposal, and ocean dumping.

PB-224 583/5GA PC$4.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME IV. DISPOSAL PROCESS DESCRIPTIONS, BIOLOGICAL AND MISCELLANEOUS WASTE TREATMENT PROCESSES.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 149p TRW-21485-6013-RU-00-Vol-4 EPA-670/2-73-053-d
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Pollution, *Hazardous materials), (*Materials handling , Hazardous materials), (*Waste disposal, Hazardous materials), Solid waste disposal, Liquid waste disposal, Industrial waste treatment, Biodeterioration, Economics, Activated sludge process, Lagoons(Ponds), Trickling filtration, Solidification, Dialysis, Electrodialysis, Ion exchanging, Process charting, Metal industry, Costs, Fluidized bed processing, Neutralizing.
Identifiers: Aeration ponds, Reverse osmosis, National disposal sites.

This volume provides descriptions of selected processes currently used for the treatment or disposal of hazardous wastes. These descriptions detail the important features of each process and discuss their applicability to the various classes of waste materials. This volume contains descriptions of four biological processes including activated sludge, aerated lagoons, oxidation ponds, and trickling filter. There are also five miscellaneous processes described including dialysis, electrodialysis, ion exchange, reverse osmosis and radioactive waste solidification.

PB-224 584/3GA PC$4.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME V. NATIONAL DISPOSAL SITE CANDIDATE WASTE STREAM CONSTITUENT PROFILE REPORTS. PESTICIDES AND CYANIDE COMPOUNDS.
Final rept.,

R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 146p TRW-21485-6013-RU-00-Vol-5 EPA-670/2-73-053-e
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Waste disposal, Hazardous materials), (*Pollution, *Hazardous materials), (*Materials handling, Hazardous materials), (*Pesticides, Hazardous materials), (*Cyanides, Hazardous materials), Profiles, Solid waste disposal, Liquid waste disposal, Chlorine organic compounds, Toxicology, Management planning, Industrial waste treatment, Incinerators, Injection wells, Sanitary landfills, Physical properties, DDT, Aldrin, Chlordane, Dieldrin, Endrin.
Identifiers: National Disposal Sites, Parathion, Heptachlor.

This volume contains summary information and evaluation of waste management methods in the form of Profile Reports for pesticides and inorganic cyanides. These Profile Reports were prepared for either a particular hazardous waste stream constituent or a group of related constituents. Each Profile Report contains a discussion of the general characteristics of the waste stream constituents, their toxicology and other associated hazards, the definition of adequate management for the waste material, an evaluation of the current waste management practices with regard to their adequacy, and recommendation as to the most appropriate processing methods available and whether the waste material should be considered as a candidate for National Disposal, Industrial Disposal, or Municipal Disposal.

PB-224 585/0GA PC$5.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME VI. NATIONAL DISPOSAL SITE CANDIDATE WASTE STREAM CONSTITUENT PROFILE REPORTS. MERCURY, ARSENIC, CHROMIUM, AND CA DMIUM COMPOUNDS.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 207p TRW-21485-6013-RU-00-Vol-6 EPA-670/s-73-053-f
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Waste disposal, Hazardous materials), (*Pollution, *Hazardous materials), (*Mercury inorganic compounds, Hazardous materials), (*Materials handling, Hazardous materials), (*Arsenic inorganic compounds, Hazardous materials), (*Chromium inorganic compounds, Hazardous materials), (*Cadmium inorganic compounds, Hazardous materials), Solid waste disposal, Liquid waste disposal, Profiles, Industrial waste treatment, Management planning, Arsenic organic acids, Pesticides, Cacodylic acid, Toxicology, Reclamation, Metal finishing, Metal industry, Pigments, Chromates, Tanning materials, Activated sludge process, Precipitation(Chemistry), Ion exchanging, Sewage, Costs, Activated carbon, Sanitary landfills, Photographic processing chemicals, Regulations, Local government, State government, National government.
Identifiers: National disposal sites, Reverse osmosis.

This volume contains summary information and evaluation of waste management methods in the form of Profile Reports for mercury, arsenic, chromium, and cadmium compounds. These Profile Reports were prepared for either a particular hazardous waste stream constituent or a group of related constituents. Each Profile Report contains a discussion of the general characteristics of the waste stream constituents, their toxicology and other associated hazards, the definition of adequate management for the waste material, an evaluation of the current waste management practices with regard to their adequacy, and recommendation as to the most appropriate processing methods available and whether the waste material should be considered as a candidate for National Disposal, Industrial Disposal, or Municipal Disposal.

PB-224 586/8GA PC$6.25/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME VIII. NATIONAL DISPOSAL SITE CANDIDATE WASTE STREAM CONSTITUENT PROFILE REPORTS. PROPELLANTS, EXPLOSIVES, AND WARFA RE MATERIEL.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 266p TRW-21485-6013-RU-00-VO1-7 EPA-670/2/73-053-g
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Waste disposal, *Hazardous materials), (*Pollution, Hazardous materials), (*Materials handling, Hazardous materials), (*Propellants, Waste disposal), (*Explosives, Waste disposal), (*Military chemical agents, Waste disposal), Profiles, Toxicology, Management planning.
Identifiers: National Disposal Sites.

This volume contains summary information and evaluation of waste management methods in the form of Profile Reports for selected propellants, explosives, and chemical warfare materiel. These Profile Reports were prepared for either a particular hazardous waste stream constituent or a group of related constituents. Each Profile Report contains a discussion of the general characteristics of the waste stream constituents, their toxicology and other associated hazards, the definition of adequate management for the waste material, an evaluation of current waste management practices with regard to their adequacy, and recommendation as to the most appropriate processing methods available and whether the waste material should be considered as a candidate for National Disposal, Industrial Disposal, or Municipal Disposal.

PB-224 587/6GA PC$3.75/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME VIII. NATIONAL DISPOSAL SITE CANDIDATE WASTE STREAM CONSTITUENT PROFILE REPORTS. MISCELLANEOUS INORGANIC AND ORGANIC COMPOUNDS.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 79p TRW-21485-6013-RU-00-Vol-8 EPA-670/2-73-053-h
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Waste disposal, *Hazardous materials), (*Pollution, Hazardous materials), (*Materials handling, Hazardous materials), Antimony inorganic compounds, Cyanides, Electrolytes, Fluorine, Chlorine, Metal carbonyls, Nickel organic compounds, Perchloric acid, Acroleins, Organic sulfates, Chlorine aromatic compounds, Organic sulfates, Profiles, Toxicology, Local government, State government, National government, Regulations, Industrial wastes, Management planning, Chromium inorganic compounds, Activated carbon, Biodeterioration, Ion exchanging, Incinerators, Injection wells.
Identifiers: National disposal sites, Phenol/pentachloro, Dimethyl sulfate.

This volume contains summary information and evaluation of waste management methods in the form of Profile Reports for miscellaneous inorganic and organic compounds. These Profile Reports were prepared for either a particular hazardous waste stream constituent or a group of related constituents. Each Profile Report contains a discussion of the general characteristics of the waste stream constituents, their toxicology and other associated hazards, the definition of adequate management for the waste material, an evaluation of the current waste management practices with regard to their adequacy, and recommendation as to the most appropriate processing methods available and whether the waste material should be considered as a candidate for National Disposal, Industrial Disposal, or Municipal Disposal.

PB-224 588/4GA PC$4.75/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME IX. NATIONAL DISPOSAL SITE CANDIDATE WASTE STREAM CONSTITUENT PROFILE REPORTS. RADIOACTIVE MATERIALS.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Sant. Aug 73, 168p TRW-21485-6013-RU-00-Vol-9 EPA-670/73-053-i
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Pollution, *Hazardous materials), (*Materials handling, Hazardous materials), (*Radioactive waste processing, *Waste disposal), Radioactive contaminants, Radioactive isotopes, Regulations, National government, Air pollution, Water pollution, Profiles, Local government, State government, Reclamation.
Identifiers: National Disposal Sites, Permissable dosage.

This volume contains summary information and evaluation of waste management methods in the form of Profile Reports for radioactive materials. These Profile Reports were prepared for either a particular hazardous waste stream constituent or a group of related constituents. Each Profile Report contains a discussion of the general characteristics of the waste stream constituents, their toxicology and other associated hazards, the definition of adequate management for the waste material, an evaluation of the current waste management practices with regard to their adequacy, and recommendation as to the most appropriate processing methods available and whether the waste material should be considered as a candidate for National Disposal, Industrial Disposal, or Municipal Disposal.

PB-224 589/2GA PC$7.00/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME X. INDUSTRIAL AND MUNICIPAL DISPOSAL CANDIDATE WASTE STREAM CONSTITUENT PROFILE REPORTS. ORGANIC COMPOUNDS.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 316p TRW-21485-6013-RU-00-Vol-10 EPA-670/2-73-053-j
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Water disposal, Organic compounds), (*Pollution, Hazardous materials), (*Materials handling, Organic compounds), (*Organic compounds, Hazardous materials), Industrial waste treatment, Solid waste disposal, Liquid waste disposal, Aldehydes, Ketones, Organic acids, Esters, Nitriles, Nitrogen organic compounds, Anilines, Aliphatic hydrocarbons, Carboxylic acids, Alcohols, Glycols, Amines, Aromatic hydrocarbons, Petroleum industry, Recycling, Reclamation, Management planning,

Profiles, Toxicology, Drug industry, Chemical industry, Benzyl chloride, Phenols, Thiols, Cresols, Hormones, Carbon disulfide, Benzenesulfonic acids.
Identifiers: National disposal sites.

This volume contains summary information and evaluation of waste management methods in the form of Profile Reports for organic compounds. These Profile Reports were prepared for either a particular hazardous waste stream constituent or a group of related constituents. Each Profile Report contains a discussion of the waste stream constituents their toxicology and other associated hazards, the definition of adequate management for the waste material, an evaluation of the current waste management practices with regard to their adequacy, and recommendation as to the most appropriate processing methods available and whether the waste material should be considered as a candidate for National Disposal, Industrial Disposal, or Municipal Disposal.

PB-224 590/0GA PC$5.75/MF$1.45
TRW Systems Group Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME XI. INDUSTRIAL AND MUNICIPAL DISPOSAL CANDIDATE WASTE STREAM CONSTITUENT PROFILE REPORTS. ORGANIC COMPOUNDS (CONT INUED).
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 247p TRW-21485-6013-RU-00-Vol-11 EPA-670/2-73-053-k
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Waste disposal, Organic compounds), (*Pollution, *Hazardous materials), (*Materials handling, Organic compounds), (*Organic compounds, Hazardous materials), Solids waste disposal, Liquid waste disposal, Industrial waste treatment, Ethers, Aromatic hydrocarbons, Glycols, Nitrogen organic compounds, Chlorohydrocarbons, Halohydrocarbons, Lead organic compounds, Tetraethyl lead, Phosgen, Metal organic compounds, Haloalkanes, Quinones, Chlorine aliphatic compounds, Nitro compounds, Benzoyl peroxide, Hydrazines, Maleic anhydride, Oxalic acid, Profiles, Reclamation, Management planning, Chemical industry, Toxicology.
Identifiers: National Disposal Sites, Chloropicrin, Methane/nitro-trichloro, Tolyl phosphates, Waste recycling.

This volume contains summary information and evaluation of waste management methods in the form of Profile Reports for organic compounds. These Profile Reports were prepared for either a particular hazardous waste stream constituent or a group of related constituents. Each Profile Report contains a discussion of the waste stream constituents, their toxicology and other associated hazards, the definition of adequate management for the waste material, an evaluation of the current waste management practices with regard to their adequacy, and recommendation as to the most appropriate processing methods available and whether the waste material should be considered as a candidate for National Disposal, Industrial Disposal, or Municipal Disposal.

PB-224 591/8GA PC$7.25/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME XII. INDUSTRIAL AND MUNICIPAL DISPOSAL CANDIDATE WASTE STREAM CONSTITUENT PROFILE REPORTS. INORGANIC COMPOUNDS.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 330p TRW-21485-6013-RU-00-Vol-12 EPA-670/2-73-053-i
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Waste disposal, Inorganic compounds), (*Pollution, *Hazardous materials), (*Materials handling, Inorganic compounds), (*Inorganic compounds, Hazardous materials), Fluorides, Aluminum compounds, Asbestos, Inorganic phospjates, Oxides, Ammonium compounds, Sulfur inorganic compounds, Sodium inorganic compounds, Potassium inorganic compounds, Beryllium inorganic compounds, Sulfates, Carbon monoxide, Inorganic acids, Magnesium, Aluminum, Tantalum, Silicon dioxide, Arsenic, Boron inorganic compounds, Hydrazine, Cobalt inorganic compounds, Barium inorganic compounds, Antimony inorganic compounds, Magnesium inorganic compounds, Zinc inorganic compounds, Bromine, Inorganic nitrates, Chlorosulfuric acid, Chromium, Chlorine inorganic compounds, Selenium inorganic compounds, Management planning, Profiles, Toxicology, Industrial wastes, Industrial waste treatment, Reclamation, Chemical industry, National disposal sites.
Identifiers: National disposal sites.

This volume contains summary information and evaluation of waste management methods in the form of Profile Reports for inorganic compounds. These Profile Reports were prepared for either a particular hazardous waste stream constituent or a group of related constituents. Each Profile Report contains a discussion of the general characteristics of the waste stream constituents, their toxicology and other associated hazards, the definition of adequate management for the waste material, an evaluation of the current waste management practives with regard to their adequacy, and recommendation as to the most appropriate processing methods available and whether the waste material should be considered as a candidate for National Disposal, Industrial Disposal, or Municipal Disposal.

PB-224 592/6GA PC$6.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME XIII. INDUSTRIAL AND MUNICIPAL DISPOSAL CANDIDATE WASTE STREAM CONSTITUENT PROFILE REPORTS. INORGANIC COMPOUNDS (CO NTINUED).
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 290p TRW-21485-6013-RU-00-Vol-13 EPA-670/2-73-053-m
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Waste disposal, Inorganic compounds), (*Pollution, *Hazardous materials), (*Materials handling, Inorganic compounds), (*Inorganic compounds, Hazardous materials), Industrial wastes, Industrial waste treatment, Mining, Solid waste disposal, Liquid waste disposal, Tailings, Bauxite, Chromium inorganic compounds, Hydrazoic acid, Hydrobromic acid, Hydrogen cyanide, Hydrogen sulfide, Lead inorganic compounds, Manganese, Manganese inorganic compounds, Nickel inorganic compounds, Phosphorus, Selenium, Antimonides, Arsenides, Selenides, Thallium, Phosphorus halides, Phosphorus sulfides, Strontum, Sodium inorganic compounds, Zinc inorganic compounds, Water pollution, Taconite, Profiles, Management planning, Toxicology, Recycling, Reclamation.
Identifiers: National Disposal Sites.

This volume contains summary information and evaluation of water management methods in the form of Profile Reports for inorganic compounds. These Profile Reports were prepared for either a particular hazardous waste stream constituent or a group of related contituents. Each Profile Report contains a discussion of the general characteristics of the waste stream constituents, their toxicology and other associated hazards, the definition of adequate management for the waste material, an evaluation of the current waste management practices with regard to their adequacy, and recommendation as to the most appropriate processing methods available and whether the waste material should be considered as a candidate for National Disposal, Industrial Disposal, or Municipal Disposal.

PB-224 593/4GA PC$4.75/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME XIV. SUMMARY OF WASTE ORIGINS, FORMS, AND QUANTITIES.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 160p TRW-21485-6013-RU-00-Vol-14 EPA-670-2-73-053-n
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 593-SET.

Descriptors: (*Wastes, *Hazardous materials), (*Pollution, Hazardous materials), (*Industrial wastes, Hazardous materials), Classifications, Paints, Pigments, Electroplating, Storage batteries, Lead, Cadmium, Chromates, Cyanides, Selenium, Mercury, Metal finishing, Copper, Chromium, Radioactive wastes, Pesticides, Herbicides, Fungicides, Plant location, Geography, Chlorine organic compounds, Mercury inorganic compounds, Flue dust, Metal industry, Arsenic inorganic compounds, Phosphoric acid, Lead inorganic compounds, Lead organic compounds, Petroleum industry, Printing inks, Textile industry, Xerography, Boron, Boron hydrides, Tanning materials, Iron and steel industry, Hydrofluoric acid, Fluoroboric acid, Acroleins, Aromatic polycyclic hydrocarbons, Phenols, Biphenyl, Explosives, Propellants, Military chemical agents, Water pollution, Air pollution, Inventories.
Identifiers: Cacodylic acid, National Disposal Sites, Mine wastes, Chloropicrin.

This volume provides information on the origins, forms, and quantities of 13 groups of hazardous waste stream constituents, including pesticides, mercury and mercury compounds, arsenic and arsenic compounds, cadmium and cadmium compounds, lead compounds, soluble copper compounds, selenium and selenium compounds, boron hydrides, chromium compounds, inorganic cyanides, hydrofluoric and fluoboric acids, specific organic chemicals, explosive propellant and chemical warfare materiel and radioactive material. Separate reports on paint wastes and wastes from battery manufacture and the electroplating industry are also presented.

PB-224 594/2GA PC$4.25/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME XV. RESEARCH AND DEVELOPMENT PLANS.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, and M. J. Santy. Aug 73, 109p TRW-21485-6013-RU-00-Vol-15 EPA-670/2-73-053-o
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Pollution, *Hazardous materials), (*Materials handling, Hazardous materials), (*Management planning, Hazardous materials), (*Waste disposal, Harzardous materials), Solid waste disposal, Liquid waste disposal, Pesticides, Incinerators, Design, Industrial wastes, Reclama-

tion, Metal industry, Cementing, Cements, Adhesives, Polymers, Sludge disposal, Soils, Arsenic, Mercury, Fluidized bed, Vaporizing, Process charting, Decontamination, Iron, Aluminum, Titanium, Hydrogen chloride, Chlorine, Hydrogen, Heat of reaction, Chlorides, Feasibility, water treatment, Chemical removal, Sulfur, Sulfur organic compounds, Sulfur oxides, Air pollution, Flue gases.
Identifiers: Mine wastes, Limestone scrubbing.

This volume presents more detailed information for some of the projects proposed and summarized in Chapter 6 of Volume I. The projects described herein include cementation processes, both inorganic and organic, sulfur sequestering, arsenic removal from soil, recovery of alumina from clay and sulfur oxide scrubbing wastes, characterization of incineration parameters for the safe disposal of pesticides, new chemical concepts for use of waste pesticides, and isolation of mercury and other heavy metals from dilute waste streams.

PB-224 595/9GA PC$8.25/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
RECOMMENDED METHODS OF REDUCTION, NEUTRALIZATION, RECOVERY, OR DISPOSAL OF HAZARDOUS WASTE. VOLUME XVI. REFERENCES.
Final rept.,
R. S. Ottinger, J. L. Blumenthal, D. F. Dal Porto, G. I. Gruber, and M. J. Santy. Aug 73, 424p TRW-21485-6013-RU-00-Vol-16 EPA-670/2-73-053-p
Contract EPA-68-03-0089
Paper copy also available from NTIS $72.00/set of 16 reports as PB-224 579-SET.

Descriptors: (*Pollution, *Hazardous materials), (*Materials handling, Hazardous materials), (*Waste disposal, Hazardous materials), (*Bibliographies, Hazardous materials).

This volume contains the references used in the Hazardous Waste Disposal Study. The references are listed in a chronological accession number order. These accession numbers were used as unchanging reference numbers throughout the study to avoid confusion from one report to another.

PB-224 607/2GA PC$4.75/MF$1.45
Waccamaw Regional Planning Commission, Georgetown, S.C.
ZONING ORDINANCE OF HORRY COUNTY, SOUTH CAROLINA.
Jun 73, 51p SC-40-0014-0653
Prepared in cooperation with Horry County Planning, Development and Tourism Commission. Sponsored in part by South Carolina Office of Governor, Columbia.

Descriptors: (*Regional planning, *South Carolina), (*Land use zoning, Regional planning), Boundaries, Regulations, Residential buildings, Commercial buildings, Industrial buildings.
Identifiers: *Horry County(South Carolina).

The zoning ordinance for Horry County, S.C. consists of a general plan to control and direct the use of property and the development thereof, in the county by dividing the county into districts according to the present and potential use of such properties.

PB-224 608/0GA PC$8.25/MF$1.45
Saint Louis County Dept. of Planning, Clayton, Mo.
ZONING ORDINANCE AND SUBDIVISION REGULATIONS, JENNINGS, MISSOURI.
Final rept. Jul 72-Jun 73,
John D. Demetriades, and Douglas James. Jun 73, 123p JENMO-200-ZO

Descriptors: (*Urban planning, *Missouri), (*Land use zoning, Ordinances), Regulations, Boundaries, Residential buildings, Commercial buildings, Industrial buildings, Law enforcement.
Identifiers: *Jennings(Missouri).

The document contains recommended regulations to guide physical development in the city of Jennings, MO, according to the general guidelines set forth in the comprehensive plan.

PB-224 609/8GA PC$12.50/MF$1.45
Saint Louis County Dept. of Planning, Clayton, Mo.
COMPREHENSIVE PLAN, JENNINGS, MISSOURI.
Final rept. Jul 72-Jun 73.
Jun 73, 207p JENMO-200-PL
Prepared in cooperation with City of Jennings, Mo.

Descriptors: (*Urban planning, *Missouri), Community development, Central city, Population growth, Residential buildings, Commercial buildings, Parks, Urban transportation, Streets, Services, Objectives, Public buildings.
Identifiers: *Jennings(Missouri).

Jennings, a city of 2460 acres of land, is the seventh most populous municipality in St. Louis County with approximately 19,400 persons residing within its boundaries. Two regional shopping centers (Northland and River Roads), other commercial concentrations along West Florissant Avenue and Jennings Station Road, and some light industrial activity along the Norfolk and Western Railroad tracks, which bisect the city, make Jennings one of the most diversified communities in St. Louis County, Because, the city of Jennings is practically totally developed and many of its neighborhoods are more than fifty years old, the plan places emphasis on revitalization efforts, and proposes a redevelopment program centered around the creation of a new municipal park, in conjunction with a revitalization program for the West Florissant Avenue Neighborhood Business District. (Modified author abstract)

PB-224 612/2GA PC$3.75/MF$1.45
Kentucky Office for Local Government, Frankfort.
HAZARD, KENTUCKY, STREET NAMING AND PROPERTY NUMBERING PLAN, 1973.
Final rept.
Jun 73, 33p CK-OLG-73-65
Prepared in cooperation with Schimpeler-Corradino Associates, Louisville, Ky.

Descriptors: (*Streets, *Numbering systems), (*Urban planning, *Kentucky), Real property, Identification systems, Problem solving, Improvement, Models.
Identifiers: *Hazard(Kentucky).

The principle purpose of a street naming and property numbering system is to enable those unfamiliar with an area to find a street and house number as quickly and as easily as possible. Problems are created when inadequate planning produces an unworkable system, failing to accommodate an expanding community. This study investigates the various unworkable aspects of the Hazard street naming system such as duplicate or similarly sounding and therefore confusing names. Other problems, such as a lack of consistent property numbering, are also identified. A description of four model street naming and property numbering systems is presented with an analysis of their applicability to Hazard.

PB-224 614/8GA PC$3.00/MF$1.45
Waccamaw Regional Planning Commission, Georgetown, S.C.
RECONNAISSANCE SURVEY AND PROGRAM DESIGN: ATLANTIC BEACH, S.C.
Sep 73, 14p SC-40-0014-0713
Sponsored in part by South Carolina Office of the Governor, Columbia.

Descriptors: (*Urban planning, *South Carolina), Land use, Population growth, Residential buildings, Police, Services, Economic development, Parks, Recreation, Education, Local government, Public utilities.
Identifiers: *Atlantic Beach(South Carolina).

The report is a standard reconnaissance survey conducted in accordance with HUD 701 requirements and designed to identify the problems and needs of the locality that can be beneficially affected by planning, and to devise a comprehensive planning program tailored to the locality's problems and needs. (Author)

PB-224 618/9GA PC$3.00/MF$1.45
Buffalo City Dept. of Community Development, N.Y. Div. of Programming.
CITY OF BUFFALO PLAN FOR IMPLEMENTATION OF A CITIZEN COMMUNICATION PROCESS.
Final rept.
Mar 73, 16p CBNY-63073-4

Descriptors: (*Local government, *Participative management), (*Urban planning, *New York), Communicating, Project planning, Mass media, Surveys, Information systems, Evaluation.
Identifiers: *Citizen participation, Buffalo(New York).

The report covers the development of a citizen communication process to effect citizen involvement in the city's planning process and a plan for its implementation. It defines the citizen communication process in both narrative and graphical terminology, and emphasizes the use of mass media and survey techniques as effective means of disseminating information to the community. The implementation plan includes methodologies for determination of communication priorities for existing programs, determination of audience profiles and target audience identification, procurement of media support, and program evaluation.

PB-224 619/7GA PC$3.00/MF$1.45
Buffalo City Dept. of Community Development, N.Y. Div. of Programming.
CITY OF BUFFALO, REVIEW OF THE RECOMMENDATION FOR A DEPARTMENT OF GENERAL SERVICES. MEMORANDUM REPORT.
Final rept.
Aug 73, 12p CBNY-63073-1A
Prepared by Cresap, McCormick and Paget, Inc.

Descriptors: (*Local government, *Recommendations), (*Public administration, *Reviews), (*Services, *New York), Organizations, Purchasing, Motor vehicles, Management, Data processing, Public buildings, Maintenance.
Identifiers: Buffalo(New York).

The document reviews and analyzes previously made recommendations regarding the establishment of a Department of General Services, which was to include divisions of Purchase, Motor Equipment Management, Data Processing, and Building Services.

PB-224 626/2GA PC$6.25/MF$1.45
Spokane Metropolitan Area Transportation Study, Wash.
INITIAL TRANSPORTATION STUDY: SURVEY FINDINGS, DATA PROJECTIONS, RECOMMENDATION.
Final rept.,
Dec 72, 265p
Sponsored in part by Washington State Highway Commission, Olympia. Prepared in cooperation with Department of Transportation, Washington, D.C.

Descriptors: (*Urban planning, *Washington(State)), (*Urban transportation, Urban planning), Mass transportation, Forecasting, Streets, Highways, Socioeconomic status, Land use.

Identifiers: *Spokane(Washington), Spokane County(Washington).

The study's basic objective was to formulate a transportation plan as an integral element of the comprehensive plan of the metropolitan area. The transportation plan was to be developed to serve projected year 2000 travel, and was to include successive stages leading to the development of the long-range system. Various modes of transportation were considered in developing a balanced system of streets, highways and public transit facilities that will efficiently and effectively serve the metropolitan travel needs. Included in the Study area was all land in the vicinity of the City of Spokane likely to be urbanized within the forecast period (1965-2000).

PB-224 627/0GA PC$14.50/MF$1.45
Kentucky Office for Local Government, Frankfort.
FRANKFORT-FRANKLIN COUNTY TRANSPORTATION PLAN AND COMMUNITY FACILITIES PLAN, 1973.
Final rept.
Jun 73, 247p CK-OLG-73-64
Prepared by Schimpeler-Corradino Associates, Louisville, Ky.

Descriptors: (*Regional planning, *Kentucky), (*Transportation, Regional planning), Land use, Highways, Railroads, Air transportation, Buses(Vehicles), Trends, Urban transportation, Public utilities, Fire safety, Public health.
Identifiers: Frankfort(Kentucky), Franklin County(Kentucky).

Contents: Existing transportation system; Transportation patterns and trends; County-wide implications of urban transportation needs of Frankfort, Kentucky; and Community facilities plan.

PB-224 632/0GA PC$7.25/MF$1.45
Texas Dept. of Community Affairs, Austin.
LIVINGSTON COMPREHENSIVE PLAN REPORT.
Apr 73, 104p CPA-TX-06-16-1023(5)
Prepared in cooperation with the South/West Associates, Bryan, Tex., and Frank W. Suggitt and Associates, College Station, Tex.

Descriptors: (*Urban planning, *Texas), Reviews, Demography, Land use, Facilities, Utilities, Circulation, Residential buildings, Policies, Zoning, Ordinances, Scheduling, Project planning.
Identifiers: *Livingston(Texas).

The report is a summary of earlier interim reports on population, land use, community facilities and utilities, circulation and housing in Livingston, TX. It contains a comprehensive general plan for development, 1973-1992, including proposals for implementation, such as zoning and subdivision ordinances, development policies, phasing and priorities, and capital improvements program. As part of a program for the city to reach its 1992 population goal of 7,000, the community's town center and Choates Creek beautification project are emphasized elements of the overall plan. Flood plains and development control on steep slopes are also highlighted considerations of the 20 year plan.

PB-224 638/7GA PC$5.75/MF$1.45
International Association of Chiefs of Police, Inc., Gaithersburg, Md. Highway Safety Div.
POLICE TRAFFIC SERVICES HANDBOOK FOR GOVERNOR'S HIGHWAY SAFETY REPRESENTATIVES.
Final rept.,
Adam G. Johnson, N. Darwick, R. Sostkowskii, F. Robertson, and A. Smith. Sep 73, 235p* DOT-HS-800 298
Contract DOT-HS-036-2-404

Descriptors: (*Traffic safety, *Handbooks), (*Police, Traffic safety), (*State government, Management planning), Reviews, Projects, Data processing, Specialized training.

The publication is prepared for State Highway Safety Administrators, to provide them with a grounding in Police Traffic Services. It is not designed for the use of police executives or students of police administration. The handbook provides the highway safety planner with a conceptualization of the purpose, goals, and objectives of a police traffic services program. It is meant to serve as a basic frame of reference for the planner relative to program definition, enforcement techniques and countermeasures, and should be of considerable value to him in finding ways to upgrade the quality and level of Police Traffic Services. Fundamentals of police organization and management are treated briefly but adquately enough to give the uninitiated a feel for the quasi-military environment within which traffic law enforcement functions operate. The chapter on Evaluation and Assessment may be of particular value to Highway Safety Administrators, in that it is applicable to all disciplines and not only to the function of Police Traffic Services.

PB-224 640/3GA PC$3.25/MF$1.45
Transport and Road Research Lab., Crowthorne (England).
NOTES ON THE INTERNATIONAL CONFERENCE ON THE STRUCTURAL DESIGN OF ASPHALT PAVEMENTS (3RD), HELD IN LONDON, ON SEPTEMBER 1972.
1973, 22p TRRL-LR-579

Descriptors: (*Flexible pavements, Structural design), Meetings, Construction materials, Failure, Loads(Forces), Soil mechanics, Pavement bases, Temperature distribution, Deformation, Stresses, Bitumers, Nondestructive tests, Great Britain.

The report summarises the new information contained in the papers presented at the Third International Conference on the structural design of asphalt pavements held in London in September 1972, and considers its implications on the Transport and Road Research Laboratory Program. (Modified author abstract)

PB-224 641/1GA PC$4.75/MF$1.45
Federal Highway Administration, Washington, D.C.
PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON HIGHWAY SIGN SYMBOLOGY HELD IN WASHINGTON, D.C. JUNE 5-6, 1972.
1972, 165p*
Co-sponsored by International Road Federation, Washington, D.C.

Descriptors: (*Vehicular traffic control, *Meetings), (*Highways, Vehicular traffic control), Proceedings, Symbols, Standardization, Design, Evaluation.
Identifiers: *Highway signs.

An International Conference on Highway Sign Symbology was held in Washington, D.C., on June 5 and 6, 1972, under the sponsorship of the Federal Highway Administration and the International Road Federation for a review and analysis of symbols used on highway signs throughout the world. The conference was designed to bring together the ideas, concepts, research and judgment of internationally known specialists who have played active roles in developing and evaluating symbol signs effective highway use. Twelve formal presentations were made covering the areas of symbol design, symbol evaluation and development with representations of ten countries participating and sharing their knowledge and experience.

PB-224 642/9GA PC$5.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Energy Lab.
QUANTIFICATION OF AQUATIC ENVIRONMENTAL IMPACT OF ELECTRIC POWER GENERATION.
Final rept.,
J. Gruhl. Apr 73, 176p* MIT-EL-73-004
Grant NSF-GI-32874

Descriptors: (*Electric power generation, *Environmental surveys), (*Water pollution, Electric power generation), Forecasting, Heated effluents, Cooling water, Mathematical models, Limnology, Impact, Systems analysis, Optimization, Food chains, Toxicity, Aquatic biology.
Identifiers: *Thermal pollution.

Proposed is a method for creating, to the extent of their predictability, the proper and timely forecasts of the aquatic ecosystem consequences of electric power system operation. A procedure is developed and intended for use in quantifying the ecological sacrifices associated with a number of desirable regional dispatch schedules. With the use of this technique, either as an operational tool or as a simulation tool, associated with a given reliability level, optimum scheduling schemes can be used to evaluate optimum dollar cost - environmental impact pairings. Essentially calculated is the change in desirability to man of the ecosystem. Predictive techniques are developed for the avoidance of mortalities due to thermotoxic synergisms. This project is primarily intended as a state-of-the-art survey of the research areas contributing to this area with particular attention paid to the precise modeling techniques available. However, a new method is presented for combining these inputs in a thorough and consistent manner to obtain a meaningful environmental impact measure. (Modified author abstract) Portions of this document are not fully legible.

PB-224 644/5GA PC$3.00/MF$1.45
Mitre Corp., McLean, Va.
URBAN TRANSPORTATION: ASSESSING NEEDS AND STRATEGIES FOR THE FUTURE.
Technical paper,
C. A. Zraket, and G. E. Mouchahoir. Jan 73, 50p* MTP-378

Descriptors: (*Urban planning, *Urban transportation), Mass transportation, Land use, Environmental surveys, Urban areas, Socioeconomic status, Financing, New York, Japan, Air pollution, Gasoline, Fuel oil, Consumption, Electric equipment.

PB-224 656/9GA PC$3.75/MF$1.45
Washington State Dept. of Highways, Olympia.
A CRITICAL REVIEW OF MATHEMATICAL DIFFUSION MODELING TECHNIQUES FOR PREDICTING AIR QUALITY WITH RELATION TO MOTOR VEHICLE TRANSPORTATION.
Research progress rept. (Final),
Donna V. Lamb, Franklin I. Badgley, and August T. Rossano, Jr. Jun 73, 96p* RPR-12.1
Prepared by Washington Univ., Seattle. Depts. of Atmospheric Sciences and Civil Engineering.

Descriptors: (*Atmospheric diffusion, Mathematical models), (*Air pollution, *Motor vehicles), Reviews, Highway transportation, Particles, Nitrogen oxides, Carbon monoxide, Hydrocarbons, Oxidizers, Photochemical reactions, Exhaust gases, Recommendations.
Identifiers: Air quality.

At the request of the Washington State Department of Highways a literature review was undertaken to assess the State-of-the-art in air quality modeling as related to motor vehicle transportation problems. In addition to reviewing the published literature several private companies and governmental agencies with available models were contacted as were individuals working in the field. Models which were available for review are described and examined with respect to identification of latest State-of-the-art characteristics, model applicability, and limitations. Recommendations on the use of air quality diffusion models are offered. (Author)

PB-224 674/2GA PC$4.50/MF$1.45
Siouxland Interstate Metropolitan Planning Council, Sioux City, Iowa.

TRAFFIC COUNTING PROGRAM.
Final rept.
1972, 46p SIMPCO-11

Descriptors: (*Vehicular traffic, Counting), (*Traffic surveys, Vehicular traffic), Urban areas, Urban transportation, Urban planning, Traffic control.
Identifiers: *Sioux City(Iowa).

In order to get a more effective and useful traffic counting program, a comprehensive effort is sought to coordinate traffic counting programs of the Iowa State Highway Commission, Nebraska Dept. of Roads, South Dakota Dept. of Highways and Sioux City Traffic Engineering Department. By recognizing the needs of all parties concerned, a comprehensive and cooperative traffic surveillance program for the Sioux City is being planned. The joint effort will entail seasonal counts, network counts, turning movements counts, and significant traffic generators.

PB-224 675/9GA PC$4.00/MF$1.45
Siouxland Interstate Metropolitan Planning Council, Sioux City, Iowa.
SIMPCO GENERAL PLAN. VOLUME B: NEIGHBORHOOD ANALYSIS.
Jun 73, 39p SIMPCO-23

Descriptors: (*Regional planning, *Iowa), (*Nebraska, Regional planning), (*South Dakota, Regional planning), Neighborhoods, Boundaries, Land use, Evaluation, Urban areas, Recommendations.
Identifiers: *Woodbury County(Iowa), *Dakota County(Nebraska), *Union County(South Dakota).

A comprehensive review of the neighborhood analysis portion of the general development plan for the urbanized area is contained in this volume. The SIMPCO area has been divided into 39 planning districts using natural boundaries whenever possible or the land use and character of the area. In the smaller communities, the town itself is considered a neighborhood. Statistical material for each district is offered, and the deficiencies of the particular area which inadvertently have an affect on other areas. Therefore, each element is not to be considered individually but should be studied in depth before conclusions are drawn for the entire SIMPCO area.

PB-224 685/8GA PC$3.75/MF$1.45
Texas Transportation Inst., College Station.
FEASIBILITY OF USING HIGHWAY LITTER IN HIGHWAY CONSTRUCTION AND MAINTENANCE.
Summary rept.,
B. M. Gallaway, W. B. Ledbetter, and J. A. Epps.
Dec 71, 31p FHWA-RD-72-44
Contract FH-11-7692
Presented at Annual Meeting of the American Association of State Highway Officials, 5-10 Dec 71.

Descriptors: (*Wastes, *Reclamation), (*Pavements, Wastes), (*Solid waste disposal, *Materials recovery), Pollution, Earth fills, Feasibility, Incinerators, Aggregates, Economic analysis, Maintenance, Materials handling, Highways, Roads, Texas.
Identifiers: Litter, Sanitary landfills.

The technical and economic feasibility of using highway litter in highway construction and maintenance was investigated. A research team gathered information and made technical and economic assessments of sixteen potential uses of highway litter. A major finding was that if highway litter is considered by itself none of the potential uses investigated would be economically feasible at the present time. In order to be economically feasible, highway litter should be combined with other solid wastes in order to provide either sufficient quantities or lower the unit cost of processing required. Other major findings were that six potential uses were assessed to be both technically and economically feasible, providing the litter is combined with other solid wastes. These six uses are landfill operations, aggregate replacement for base and subbase, aggregate replacement for stabilized materials, induced trench, vehicle impact attenuators, and maintenance materials. (Modified author abstract)

PB-224 690/8GA PC$6.25/MF$1.45
Siouxland Interstate Metropolitan Planning Council, Sioux City, Iowa.
SIMPCO ECONOMIC REPORT - 1972. PART 1: INTRODUCTION AND TECHNICAL DISCUSSION.
Technical memo.,
W. Burnet Austin. May 73, 82p SIMPCO-9
Prepared in cooperation with Henningson, Durham and Richardson.

Descriptors: (*Regional planning, *Iowa), (*Nebraska, Regional planning), (*South Dakota, Regional planning), Economic development, Land use, Construction, Employment, Services, Industries, Agriculture, Commerce, Tables(Data), Policies.
Identifiers: *Woodbury County(Iowa), *Dakota County(Nebraska), *Union County(South Dakota).

Economic and land use forecasts to the years 1980, 1990 and 2000 have been prepared for the area to provide insight into the nature of local economy and the relationship of its component parts. This is then used in policy decisions by private business, public agencies and promotional groups. Data of factors needed for technical aspects of planning, such as trip generations for transportation studies, have also been prepared.

PB-224 705/4GA PC$8.50/MF$1.45
Escambia-Santa Rosa Regional Planning Council, Pensacola, Fla.
NEIGHBORHOOD ANALYSIS, PENSACOLA SMSA.
Final rept. 1 Jul 72-30 Jun 73.
Jun 73, 127p ESRRPC-73-02

Descriptors: (*Residential buildings, Surveys), (*Blighted areas, Improvement), (*Neighborhoods, *Florida), Inventories, Urban planning, Sociopsychological surveys, Economic factors, Recommendations.
Identifiers: Pensacola(Florida).

The report is the result of findings relating to urban blight. It provides an up to date inventory of existing structural condition of housing in the Pensacola SMSA. Blight is further treated in relation to the existing social-pathology of which exist in the designated neighborhood areas. A strategy for the treatment of blight, by local government, is also presented.

PB-224 706/2GA PC$4.75/MF$1.45
Missouri Dept. of Community Affairs, Jefferson City.
INITIAL HOUSING ELEMENT, SHOW-ME REGION, MISSOURI.
Interim rept.,
Kenneth L. Velharticky. Jun 73, 53p
Prepared in cooperation with Sho-Me Regional Planning Commission, Warrensburg, Mo.

Descriptors: (*Regional planning, *Missouri), (*Residential buildings, Regional planning), Trends, Quality, Plumbing, Statistical data, Standards.
Identifiers: *Johnson County(Missouri), *Lafayette County(Missouri), *Pettis County(Missouri).

The Show-me Region initial housing element is an examination of the general housing trends in Johnson, Lafayette, and Pettis County, Mo. Individual county housing is reviewed and includes an analysis of housing conditions, problems, and possible solutions in the seperate communities. When community plans relating to housing existed, the plans were included in the report. (Modified author abstract)

PB-224 707/0GA PC$3.75/MF$1.45
Missouri Dept. of Community Affairs, Jefferson City.
OPEN SPACE INVENTORY, SHOW-ME REGION, MISSOURI.
Interim rept.,
Frank J. Schwarzer. Jun 73, 34p
Prepared in cooperation with Show-Me Regional Planning Commission, Warrensburg, Mo.

Descriptors: (*Regional planning, *Missouri), (*Recreation, Regional planning), Parks, Recreational facilities, Supply(Economics), Demand(Economics), Lakes.
Identifiers: *Johnson County(Missouri), *Lafayette County(Missouri), *Pettis County(Missouri).

The Show-Me region open space inventory is a preliminary interim survey for open space and outdoor recreation in the region. This study will be used as a guide in developing an open space, recreation plan with recommendations for eliminating deficiencies in and improving the quality of living in the Johnson, Lafayette, and Pettis County area. (Modified author abstract)

PB-224 717/9GA PC$5.00/MF$1.45
Southwestern Pennsylvania Regional Planning Commission, Pittsburgh.
SCAPE: A COMPUTER MODEL FOR ALTERNATIVE SEWER SYSTEM COST EVALUATION.
Final rept.,
James P. DeAngelis, and Robert A. LaMacchia.
Dec 72, 56p SCAPE-72-Pa-P-242

Descriptors: (*Sewers, *Cost estimates), Computer programming, Cost comparison, Mathematical models, Water reclamation, Sewage treatment, Regression analysis, Sewer pipes, Pennsylvania, FORTRAN.
Identifiers: SCAPE Computer program, FORTRAN 4 programming language.

This report discusses an analytical technique for preparing statistically reliable estimates of sewage system construction and operating costs. The technique has been computer programmed in FORTRAN and may be used to determine the least cost sewer system configuration. A single expected cost and a cost range, which is based on the prediction interval of the cost estimating equations, is produced for each alternative. By comparing the cost ranges of several alternative configurations for a given area, the analyst is able to determine if he has a statistically valid least cost solution or only an apparent least cost solution. The latter case arises when the cost ranges of the lowest cost solution overlap, an indication that the least cost solution cannot be determined with statistical reliability. In addition to presenting cost information, the model estimates sewage flows, pipe sizes and slopes for each alternative. These alternatives may include gravity or forced flow, a system or combination of systems and a variety of treatment facilities depending on the required effluent quality. (Author)

PB-224 735/1GA PC$18.25/MF$1.45
Regional Planning Council, Baltimore, Md.
REGIONAL OPEN SPACE AND THE INNER-CITY RESIDENT.
Final rept.,
Albert Diehl. May 73, 323p BTL-RPC-ROSICT-5-73

Descriptors: (*Regional planning, Maryland), (*Recreational facilities, Regional planning), Research, Land, Central city, Recreation, Socioeconomic status.

Identifiers: Open space land, *Baltimore(Maryland).

The report presents the techniques and results of a study undertaken to determine to what extent regional open space facilities can meet the expressed recreation needs of the inner city resident. Specific topic areas addressed are: accessibility conditions, amount of available leisure time, preferred leisure time activities, preferred areas of activity, most pressing recreation and open space needs, and citizen suggested programs and policies. (Author)

PB-224 738/5GA PC$6.00/MF$1.45
Broome County Planning Board, Binghamton, N.Y.
HOUSING IN BINGHAMTON, VOLUME I.
Final rept.
Mar 73, 80p BCPD-HIB-J73-1
See also Volume 2, PB-224 113.

Descriptors: (*Urban planning, *New York), (*Residential buildings, Urban planning), Census, Market research, Demography, Income.
Identifiers: *Binghamton(New York).

The report provides an analysis of the Binghamton housing market using data supplied by the 1970 census of population and housing. The document is intended to serve as a source for future studies of the Binghamton housing market, as well as a preliminary analysis of problems and policies which face the city of Binghamton, N.Y.

PB-224 739/3GA PC$10.00/MF$1.45
Palm Beach County Area Planning Board, West Palm Beach, Fla.
RECREATION AND OPEN SPACE PLAN. PHASE 2.
Jun 73, 158p R-2
See also PB-213 108.

Descriptors: (*Regional planning, *California), (*Recreational facilities, Regional planning), Reviews, Inventories, Projects, Financing.
Identifiers: Open space, Palm Beach County(California).

The report constitutes the second phase of the recreation and open space planning program for Palm Beach County. An inventory of all public recreation facilities within the county as well as existing deficiencies and projected needs is presented. The report also sets forth a long range planning program which provides methods of acquiring additional recreational lands. Methods of financing are also addressed.

PB-224 740/1GA PC$3.00/MF$1.45
Washington Center for Metropolitan Studies, D.C.
MANAGING SERVICES FOR NEW COMMUNITIES.
Final rept.,
Royce Hanson. Jan 72, 27P*
Report of the Symposium on the Management of New Communities, held at Columbia, Md., and Reston Va. on 25-28 October 1970. Sponsored in part by Virginia Polytechnic Inst. and State Univ., Blacksburg. New Communities Study Center.

Descriptors: (*Services, *Community development), (*Urban planning, *Meetings), Participative management, Financing, Organizations, Systems engineering, Local government, Economic models, Virginia, Maryland.
Identifiers: Citizen participation, *New town planning, Reston(Virginia), Columbia(Maryland).

A report is made on a symposium to examine the unique problems of managing services for new communities, particularly Reston, Va. and Columbia, Md. Some of the common problems discussed are the establishment of a structure for participation; financing community services; controling the organization and programs; and providing a structure to accommodate the interest of the developer, citizens and local government. Several ideas are noted as important to public policy and private practice in the development of new communities.

PB-224 741/9GA PC$3.50/MF$1.45
Delaware Valley Regional Planning Commission, Philadelphia, Pa.
CLOSING REPORT FOR PUBLIC TRANSPORTATION.
Final technical study.
17 Oct 73, 53p UMTA-PA-09-0025-73-1

Descriptors: (*Regional planning, *Pennsylvania), (*Mass transportation, Regional planning), Surveys, Railroads, Buses(Vehicles), Planning, Recommendations, New Jersey, Rapid transit railways, Urban transportation, Management.
Identifiers: Philadelphia(Pennsylvania), Trenton(New Jersey).

The report reviews 33 comprehensive public transportation projects for the Delaware Valley Region in Pennsylvania. The emphasis of the report is on the planned development of this urbanized area with special reference to public transportation facilities and services. The various operating agencies in this area which have responsibility for short-range planning include the Southeastern Pennsylvania Transportation Authority (SEPTA), the Delaware River Port Authority (DRPA), the city of Philadelphia, the city of Trenton, and the Mercer County Improvement Authority (MICA). (Modified author abstract)

PB-224 748/4GA PC$5.25/MF$1.45
Purdue Univ., Lafayette, Inc. School of Civil Engineering.
AN EVALUATION OF A COMPLIMENTARY PASS PACKAGE AS AN ACCEPTABLE MARKETING TECHNIQUE FOR ATTRACTING NEW PASSENGERS TO URBAN BUS TRANSIT LINES.
Final rept.,
James Denis Brogan, and Kenneth W. Heathington. May 73, 178p* CE-TRA-73-1 UMTA-IN-11-0001-73-2

Descriptors: (*Passenger transportation, *Marketing), (*Bus lines, *Promoting), Incentives, Urban transportation, Mass transportation, Policies, Surveys, Motor vehicle operators, Reviews, Questionnaires, Effectiveness, Attitudes, Public relations.
Identifiers: *Transit passes.

The study examines a complimentary pass package distribution as a marketing tool designed to attract new passengers to urban bus transit lines. A complete marketing program can aid the industry in determining and providing various services which can recover lost patronage. A survey of transit operators examined past uses of complimentary pass packages in ridership promotion campaigns. Complimentary pass packages were distributed to a random sample in a selected city and subsequent pass utilization was determined by various market subgroups. Also conducted was an attitudinal survey of pass recipients' opinions toward various transportation issues. The results are reported.

PB-224 752/6GA PC$4.75/MF$1.45
Meramec Regional Planning Commission, Rolla, Mo.
STEELVILLE MISSOURI COMPREHENSIVE PLAN SUPPLEMENT, DEVELOPMENT CODES.
Final rept. 1972-73.
Jun 73, 54p
Prepared in cooperation with Missouri Dept. of Community Affairs, Jefferson City. See also PB-221 410.

Descriptors: (*Urban planning, *Missouri), (*Land use zoning, ordinances), Boundaries, Regulations, Residential buildings, Houses, Trailers, Streets, Parking facilities, Commercial buildings, Industrial buildings, Penalties.
Identifiers: *Steelville(Missouri).

The report contains a zoning, subdivision and planning code for the city of Steelville, MO.

PB-224 753/4GA PC$2.00/MF$1.45
Highway Research Board, Washington, D.C.
TRAFFIC FLOW PROPERTIES AND THEORY,
J. B. Garner. 1973, 63p HRB-Record-456
Library of Congress Catalog Card no. 73-16610 International Standard Book no. 0-309-02189-8.
Paper copy also available from Highway Research Board, National Academy of Sciences, 2101 Constitution Ave. N.W. Washington, D.C. 20418 $2.00.

Descriptors: (*Highways, Research), (*Vehicular traffic, Research), Mathematical models, Traffic surveys, Vehicular traffic control, Ramps, Freeways, Urban transportation.
Identifiers: Freeway ramp control.

Six papers discuss methods used to measure traffic flow under different situations.

PB-224 759/1GA PC$4.75/MF$1.45
Kentucky Univ., Lexington. Coll. of Engineering.
AIR POLLUTION POTENTIALS OF THE INCINERATION PRODUCTS OF DISPOSABLE DIAPERS.
Final rept.,
J. Thomas Schrodt. Jul 73, 53p UKY-TR-68-73-CME1
Sponsored in part by Proctor and Gamble Co., Cincinnati, Ohio. Paper Products Div.

Descriptors: (*Feces, Combustion products), (*Polyethylene, *Combustion products), (*Wood fibers, Combustion products), (*Nylon, Combustion products), Qualitative analysis, Quantitative analysis, Air pollution, Incinerators, Effluents, Ashes, Pyrolysis, Infrared spectrophotometers, Gas chromatography.
Identifiers: *Disposable diapers.

This research study dealt with the identification and quantitative analyses of the gaseous and condensed liquid effluents from the incineration of the three principal materials of a disposable diaper and infant fecal matter. The three materials studied were polyethylene, acrylic-bonded non-woven rayon fiber, and wood fiber padding obtained from 'Pampers,' a disposable diaper manufactured by the Proctor and Gamble Company. These three materials makeup 98% of a clean diaper. The feces used were obtained from an eighteen-month-old boy. The incinerations were carried out in a 2.5 x 100 cm vycor combustion tube at temperatures between 875 and 1200F. Oven-dried samples weighing 0.5 to 2.0 g each were burned in oxygen-nitrogen atmospheres at O2/N2 ratios of 1/4 to 1 and with oxygen available at levels between 1/8 and 2.0 times that required for complete oxidation. This range of oxygen levels was used for several reasons: First it was assumed that low O2 levels would produce minimum combustion accompanied by a high number of partially oxidized products for identification purposes. Second, it was theorized, high O2 levels would produce nearly complete combustion and the smallest number of product gases. (Modified author abstract)

PB-224 760/9GA PC$8.75/MF$1.45
Escambia-Santa Rosa Regional Planning Council, Pensacola, Fla.
PENSACOLA METROPOLITAN HOUSING STUDY.
Annual rept no. 4 (Final).
Jun 73, 135p ESRRPC-73-01

Descriptors: (*Urban planning, *Florida), (*Residential buildings, Urban planning), Inventories, Quality, Demand(Economics), Grants, Leasing, Population growth, Income, Employment, Blighted areas, Standards.

Identifiers: *Pensacola(Florida).

The report represents the fourth comprehensive analysis of housing in the Pensacola SMSA. A general overview of the two county area was conducted for the purpose of determining how the area and economy have changed and what factors effected that change. Various factors analyzed were population growth, employment trends, tourism and the status of the military. An analysis of housing was conducted to determine the present and short term housing needs and demand for the area. Current construction and demolition were monitored for the purpose of determining development trends and updating housing inventory. A field survey of housing condition was conducted for the purpose of validating and supplementing census data. A study of housing needs of special groups was conducted. Special groups studied were military families, college students, and low and moderate rental groups. The efforts of the recent curtailment of Federal Funds, in respect to these particular groups, were also discussed. From this study and previous studies on housing, it has become apparent that a more direct approach to housing, low and moderate income families, must be initiated. This study outlines a program in detail. (Author)

PB-224 762/5GA PC$3.25/MF$1.45
Siouxland Interstate Metropolitan Planning Council, Sioux City, Iowa.
SIMPCO ANNUAL REPORT 1972.
Final rept.
1972, 23p SIMPCO-3

Descriptors: (*Urban planning, *Iowa), (*Organizations, *Regional planning), Community development, Demography, Economic development, Urban areas, Objectives, Operations, Reviews.
Identifiers: Sioux City(Iowa).

The report contains the activities performed throughout the calendar year of 1972. The organizational structure is presented along with a listing of the total membership. SIMPCO is concerned with the physical planning throughout the area. Therefore, area goals and objectives have been developed to assist in providing for the orderly growth and development of the region. SIMPCO has the power of A-95 Review and this vehicle has guided the orderly growth of the area. One of the community services provided by SIMPCO is the development of an information center. A major activity is the collection, reproduction and dissemination of demographic, physical and economic data necessary for private and public decisions.

PB-224 763/3GA PC$3.75/MF$1.45
Siouxland Interstate Metropolitan Planning Council, Sioux City, Iowa.
SIMPCO (SIOUXLAND INTERSTATE METROPOLITAN PLANNING COUNCIL) UNIFIED WORK PROGRAM.
Final rept.
Jun 72, 35p SIMPCO-2

Descriptors: (*Regional planning, *Iowa), (*Organizations, *Urban areas), Decision making, Public administration, Local government, Groups, Executives, Problem solving, Reviews, Project planning, Economic development.

SIMPCO is a service-oriented agency and the main thrust of the various activities is to assist local governments, groups and individuals in the decision making process. This report outlines the various programs and designates the work elements that will be performed in the coming year. The strategy is set forth that will be used to accomplish these work elements, and the finished product is stated. The report also states the various committee functions and the organizational structure of the council.

PB-224 764/1GA PC$4.50/MF$1.45
Siouxland Interstate Metropolitan Planning Council, Sioux City, Iowa.
LEMARS HOUSING REPORT.
Final rept.
Jan 73, 46p SIMPCO-18

Descriptors: (*Urban planning, *Iowa), (*Residential buildings, Urban planning), Inventories, Demand(Economics), Income, Population growth, Trends, Houses, Trailers.
Identifiers: *LeMars(Iowa).

The report is concerned with the status of housing for the city of LeMars, IA. The report determines the 'minimum unmet need' and recommends alternative actions to be augmented by the community leaders to overcome this gap. Analysis of the need in relation to low income, elderly and minorities revealed the elderly comprised the majority of the unmet need. Emphasis was placed on the construction of units to provide adequate housing and the use of all available resources in the area to improve the status of housing.

PB-224 766/6GA PC$7.75/MF$1.45
Escambia-Santa Rosa Regional Planning Council, Pensacola, Fla.
PENSACOLA INNER CITY: AN URBAN CENTER.
Final rept.
Jun 73, 113p ESRRPC-73-03
Prepared by Milo Smith and Associates, Inc., Tampa, Fla.

Descriptors: (*Urban planning, *Florida), Central city, Land use, Residential buildings, Commercial buildings, Standards, Blighted areas, Streets, Industrial buildings, Design, Objectives, Maps.
Identifiers: *Pensacola(Florida).

The Pensacola inner city plan is intended to satisfy various planning objectives both within the region and the city of Pensacola, FL. As the primary growth center within the Escambia-Santa Rosa Region, Pensacola serves as the focal point for social, economic and cultural exchange as well as an employment and governmental center. In order to fulfill this role it is necessary that detailed plans be prepared for the city of Pensacola and that such plans complement previously prepared plans. In general, the purpose of the inner city plan is to achieve the following objectives: Provide a basis for coordinating previously prepared plans and studies affecting the Pensacola downtown area; eliminated and resolve any conflicts in areas where the plans overlap or have conflicting objectives or goals; provide a plan for the remaining portion of the immediate downtown area, and especially that portion of the area included in the downtown improvement district, which is not included in any other plans.

PB-224 769/0GA PC$4.50/MF$1.45
Siouxland Interstate Metropolitan Planning Council, Sioux City, Iowa.
ELK POINT HOUSING REPORT.
Final rept.
Apr 73, 48p SIMPCO-19

Descriptors: (*Urban planning, *South Dakota), (*Residential buildings, Urban planning), Standards, Income, Construction, Supply(Economics), Demand(Economics), Land use, Houses, Trailers.
Identifiers: *Elk Point(South Dakota).

The report is concerned with the status of housing for the city of Elk Point, SD. The planning period is for 1973 to 1980. The report depicts the housing needs for the community and delineates the types of need in relation to low income, elderly and minorities. The housing goals and actions to be implemented to achieve the goals are discussed. It was recommended that a complete housing program be developed for this city to provide for the upgrading of housing as well as the provision of new units. The majority of the need is comprised of occupied sub-standard units and the high percentage of elderly residents.

PB-224 775/7GA PC$10.00/MF$1.45
Northern Area Planning Organization, Santa Fe, N. Mex.
CHAMA MASTER PLAN.
Rept. for Jan-Aug 73.
Aug 73, 158p
Prepared by the Village of Chama Planning Commission. Prepared in cooperation with Scanlon and Associates, Inc., Sante Fe, N. Mex, and New Mexico State Planning Office.

Descriptors: (*Regional planning, *New Mexico), Community development, Objectives, Population growth, Water supply, Sewage, Residential buildings, Policies, Transportation, Land use.
Identifiers: *Chama Village(New Mexico).

The Chama master plan is a study of the Chama planning area which includes the planning area's goals and objectives, population and economy, water and sewer needs, housing, transportation, community facilities, future land use policy statement and the overall program design for a three year period. As a result of this plan, general guidelines were developed in all the forementioned areas.

PB-224 780/7GA PC$4.50/MF$1.45
Northern Area Planning Organization, Sante Fe., N. Mex.
PRELIMINARY FEASIBILITY STUDY FOR THE POJOAQUE VALLEY SEWERAGE SYSTEM.
Aug 73, 48p
Prepared by Scanlon and Associates, Inc., Santa Fe, N. Mexico, and New Mexico State Planning Office.

Descriptors: (*Regional planning, *New Mexico), (*Sewage disposal, Regional planning), Sewers, Sewage treatment, Right of way acquisition, Cost estimates, Financing, Ordinances, Effluents, Recommendations.
Identifiers: Sante Fe County(New Mexico).

The report is a preliminary feasibility study to establish overall cost figures for a community sewerage system which would serve the Pojoaque Valley and adjacent areas. Existing and future population estimates for these areas were established. Planning area maps showing existing structures, grant boundaries and Indian lands were developed. Preliminary sewer plans indicating proposed collectors and interceptor routes were prepared. Recommendations for additional investigations are also included in this report.

PB-224 782/3GA PC$3.75/MF$1.45
Southern Rio Grande Council of Governments, Las Cruces, N. Mex.
INITIAL SRG/COG LAND USE PLAN,
Jake C. Brooks. Aug 73, 31p
Prepared by New Mexico State Planning Office.

Descriptors: (*Regional planning, *New Mexico), (*Land use, Regional planning), Policies, State government, Highway planning, Data processing.
Identifiers: *Sierra County(New Mexico), *Socorro County(New Mexico), *Dona Ana County(New Mexico).

The publication summarizes land use data and analyses for the three county planning district VII, consisting of Dona Ana, Sierra and Socorro counties, sets out preliminary land use policy for the counties within the district and for the three counties collectively, and makes recommendations for future land use planning.

PB-224 784/9GA PC$5.00/MF$1.45
New Mexico State Planning Office, Santa Fe.

LAND USE POLICY STATEMENT FOR THE MCKINLEY AREA COUNCIL OF GOVERNMENTS.
Final rept.
Aug 73, 60p
Prepared by McKinley Area Council of Governments, Gallup, N.M., and Scanlon and Associates, Albuquerque, N.M.

Descriptors: (*Regional planning, *New Mexico), Land use, Objectives, Economic development, Mountains, Esthetics, Soil properties, Transportation, Urban areas, Rural areas, Policies.
Identifiers: *McKinley County(New Mexico).

The document is a statement on land use policies for McKinley County, N.M. The background of land use in the county, physical features accessibility, and ownership are discussed with relationship to future policies. The maps included are regional location, soils, physical features, accessibility, ownership, future land use and development, potential.

PB-224 786/4GA PC$3.25/MF$1.45
Southern Rio Grande Council of Governments, Las Cruces, N. Mex.
COMPREHENSIVE AND FUNCTIONAL PLANS,
Loring W. Spitler. Aug 73, 23p
Prepared by New Mexico State Planning Office.

Descriptors: (*Regional planning, *New Mexico), Objectives, Participative management, Projects.
Identifiers: *Dona Ana County(New Mexico), *Sierra County(New Mexico), *Socorro County(New Mexico).

The report is a review and analysis of the existing comprehensive and function plans within Dona Ana, Sierra, and Socorro Counties. The appropriateness and implementation feasibility of the plans are examined for compatibility with goals and objectives of the citizen's recommendations for adoptions of the plans.

PB-224 791/4GA PC$14.50/MF$1.45
Texas Dept. of Community Affairs, Austin.
COMPREHENSIVE PLAN REPORT, SCHULENBURG, TEXAS.
Final rept. 1972-1992,
Robert W. Caldwell, Charles W. Caldwell, John Nall, and Carl Williams. May 73, 246p
Prepared by Robert W. Caldwell and Associates, Bryan, Texas, and Department of Community Affairs of the State of Texas.

Descriptors: (*Urban planning, *Texas), Population growth, Land use, Residential buildings, Industrial buildings, Commercial buildings, Urban transportation, Central city, Public utilities, Neighborhoods.
Identifiers: *Schulenburg(Texas).

The comprehensive plan for Schulenburg, TX, is based on a projected population increase from 2,709 persons to a planning area population of 3,812. Adequate land use, community and public utilities, and transportation facilities have been provided accordingly.

PB-224 793/0GA PC$8.00/MF$1.45
Interstate Electronics Corp., Anaheim, Calif. Oceanics Div.
OCEAN WASTE DISPOSAL IN SELECTED GEOGRAPHIC AREAS.
Interim rept.
Jul 73, 394p* IEC-4460C1541
Contract EPA-68-01-0796

Descriptors: (*Oceans, *Soild waste disposal), Water pollution, Site surveys, Planning, Monitors, Puget Sound, New York Bight, California, Mexico Gulf, South Carolina, Criteria, Regulations, Dredges, Barges, Data, Sewage disposal, State government, Bibliographies, Benthos, Industrial wastes, Ecology, Water quality.
Identifiers: *Ocean waste disposal, San Francisco(California), Charleston(South Carolina).

The report presents the results of an intensive fact finding survey of ocean waste disposal practices in six geographic areas. The areas were the New York Bight; Charleston, South Carolina; segments of the Gulf of Mexico Coast; Southern California; San Francisco; and Pudget Sound. Ocean Disposal sites within these areas were selected to provide a representative cross section of ocean waste disposal practices in the United States. Concurrent with a field survey and personal interview program, detailed data and information research was performed. The sum of the information obtained by this coordinated program was used to establish a data base which will be used to recommend guidelines for the control of ocean waste disposal. (Author)

PB-224 799/7GA PC$8.25/MF$1.45
Southeastern New Mexico Economic Development District, Roswell.
COMPREHENSIVE PLAN, PART I. LOVINGTON, NEW MEXICO.
Final rept.,
Kenneth W. Larsen. Aug 73, 125p SNMEDD-73-LP-4
Prepared by Kenneth W. Larsen and Associates, Albuquerque, New Mexico.

Descriptors: (*Urban planning, *New Mexico), Land use, Objectives, Residential buildings, Surveys, Population growth, Employment, Schools, Income, Urban transportation, Services, Economic development, Streets, Recreation.
Identifiers: *Lovington(New Mexico.)

The report is the final comprehensive plan, Part 1, for the city of Lovington, NM. This comprehensive plan is a guide to be used by the city of Lovington in determining future policies and major decisions. The report includes the initial steps normally required to be included in comprehensive plans financed under the HUD 701 Program.

PB-224 801/1GA PC$3.50/MF$1.45
Atlanta Univ., Ga. School of Business Administration.
BIBLIOGRAPHY: TRANSPORTATION POLICY AND PROGRAM IMPACT ANALYSIS,
Sid Davis, Robert Holmes, Robert Kronley, George Napper, and Richard Prather. Aug 73, 58p* DOT-OS-30103-73-1
Contract DOT-OS-30103

Descriptors: (*Transportation management, *Bibliographies), (*Urban transportation, Planning), Policies, Decision making, Interest groups, Facilities, Impact, Systems egineering, Public relations, Highways, Regions, Investments, Grants, Community relations, Georgia.
Identifiers: *Transportation projects, *Atlanta(Georgia).

The bibliography covers three general categories in transportation management: Policy making, decision making and planning processes; roles of interest groups; impacts of transportation facilities and services on various interest groups. Content is of materials concerning and not concerning Atlanta.

PB-224 804/5GA PC$6.75/MF$1.45
Southern Rio Grande Council of Governments, Las Cruces, N. Mex.
REGIONAL OPEN SPACE, PARKS AND RECREATION PLAN,
L. A. Growcock. Aug 73, 95p
Prepared by New Mexico State Planning Office.

Descriptors: (*Regional planning, *New Mexico), Land, Parks, Recreational facilities, Management.
Identifiers: *Dona Ana County(New Mexico), *Sierra County(new Mexico), *Socorro County(New Mexico), Open space studies.

The plan presents open space and recreation information for Dona Ana, Sierra and Socorro Counties. Included are an inventory, data on recreation participation, an analysis of recreation neede and recommendations for preserving valuable open space and providing adequate parks and recreation facilities.

PB-224 805/2GA PC$11.00/MF$1.45
Northern Area Planning Organization, Santa Fe, N. Mex.
QUESTA MASTER PLAN.
Rept. for Jan-Aug 73.
Aug 73, 176p
Prepared by the Questa Village Council. Prepared in cooperation with Scanlon and Associates, Inc., Santa Fe, N. Mex., and New Mexico State Planning Office.

Descriptors: (*Regional planning, *New Mexico), Community development, Objectives, Population growth, Residential buildings, Transportation, Land use, Policies, Public utilities.
Identifiers: *Questa Village(New Mexico).

The Questa master plan is a study of the Questa planning area which includes the planning area's goals and objectives, population and economy, water and sewer needs, housing, transportation, community facilities, future land use policy statement and the overall program design for a three-year period. As a result of this plan, general guidelines were developed in all the forementioned areas.

PB-224 812/8GA PC-GPO/MF$1.45-NTIS
Stone (Ralph) and Co., Inc., Los Angeles, Calif.
INTERMEDIA ASPECTS OF AIR AND WATER POLLUTION CONTROL,
Ralph Stone, and Herbert Smallwood. Aug 73, 368p W74-00703, EPA-600/5-73-003
Contract EPA-68-01-0729
Paper copy available GPO $3.25 as EP1.23:600-73-003.

Descriptors: (*Air pollution, *Contaminants), (*Water pollution, Contaminants), Emission, Toxicity, Sulfur oxides, Nitrogen oxides, Metals, Particles, Phosphorus, Carbon monoxide, Hydrocarbons, Fluorides, Hydrogen chloride, Arsenic, Hydrogen cyanide, Ammonia, Ethylene, Pesticides, Surfactants, Law(Jurisprudence), Economics, Education, Statistical data, Mathematical models, Industrial waste treatment, Sewage treatment, Strategy.
Identifiers: *Air pollution control, *Water pollution control, Thermal pollution, *Path of pollutants.

Major air and water pollutant control strategies are identified which are of current National concern. Emphasis is on artificial transfer between air or water. Natural transfers are not treated in depth and land is considered only as a means for residue disposal. Discussions include dangers of intermedia transfer from land to air or water. Control methods for each intermedia pollutant are discussed; comparative costs and expected unit process efficiencies are given. Residue disposal methods and problems are presented. Institutional factors, regulations and strategies for pollution control are summarized and discussed. Summary data are developed for major pollutants and residues discharged nationally and in the California South Coast Region, along with product/pollutant ratios for industries represented by the Standard Industrial Classification Code and other public economic sectors. The framework for a mathematical model is developed for the prediction of the effects of change in any of the elements of the production-consumption-pollution-regulation network. (Modified author abstract)

PB-224 820/1GA PC$4.25/MF$1.45
IIT Research Inst., Chicago, Ill.
REUSE OF SOLID WASTE FROM WATER-SOFTENING PROCESSES.
Final rept.,

Raynor D. Nelson, and Eben Vey. 1973, 119p*
EPA-SW-530-56d
Grant PHS-UI-00142-01

Descriptors: (*Water softening, *Solid waste disposal), (*Materials recovery, Water softening), (*Dewatering, *Sludges), Vacuum filtration, Centrifugal filtration, Lagoons(Ponds), Sand filters, Water treatment, Filers, Cost estimates, Soil stabilization, Paints, Tiles, Calcium carbonates, Cements, Sealing compounds, Bitumens, Illinois.

The report summarizes a study of several methods for dewatering a water-softening sludge. Beneficial uses of the dewatered sludge are evaluated. Vacuum filtration after gravity thickening was found to be more economical for the area studied, the Village of Park Forest, Illinois, than centrifuging, lagooning or sand bed drying. The study found that in a dry powder or almost dry condition, the sludge has a potential use as a mineral filler in paints, floor coverings, caulking, and bituminous products, and as a soil admixture and/or soil conditioner.

PB-224 821/9GA PC$4.75/MF$1.45
Transportation Systems Center, Cambridge, Mass.
THE HANDICAPPED AND ELDERLY MARKET FOR URBAN MASS TRANSIT.
Final technical rept.
Oct 73, 172p* UMTA-MA-06-0034-73-3
Contract DOT-MA-06-0034

Descriptors: (*Passenger transportation, *Handicapped persons), (*Age, Travel), Urban transportation, Physical fitness, Requirements, Reviews, Demand(Economics), Statistical analysis, Municipalities.
Identifiers: Cleveland(Ohio), Syracuse(New York), Raleigh(North Carolina), Elderly persons.

A study was performed at the request of the Urban Transportation Advisory Council to acquire specific information on the characteristics of the handicapped and elderly population's special transit needs. The data include the size and spatial distribution of the handicapped and elderly, numbers of the handicapped with transportation disfunctions, a measure of the current availability of public urban transportation to the elderly and handicapped compared to their spatial distribution, transit use, and potential transit usage. Methodologies employed include: a local level analysis of Cleveland, Syracuse and Raleigh, cities chosen as typical.

PB-224 833/4GA PC$5.25/MF$1.45
Kentucky Water Rseources Inst., Lexington.
SOCIAL AND CULTURAL IMPACT OF A PROPOSED RESERVOIR ON A RURAL KENTUCKY SCHOOL DISTRICT.
Research rept.,
Charles R. Smith, and Philip Drucker. Jan 73, 189p
RR-60 W74-00557 , OWRR-B-027-KY(1)
Contract DI-14-31-0001-3595

Descriptors: (*Multiple purpose reservoirs, Impact), (*Urbanization, *Kentucky), Regional planning, Social change, Culture(Social sciences), Education, Rural areas, Benefit cost analysis.
Identifiers: Spencer County(Kentucky), Taylorsville dam(Kentucky).

The study uses anthropological concepts and research methods to study attitudes toward education and the educational system of a central Kentucky school district with the goal of predicting the impact of a proposed multi-purpose reservoir, and of proposing options for forestalling dysfunctional social aspects of that impact. The social impact will result from the fact that a now rurally oriented region has already begun to attract urbanite residents from Kentucky's largest city, who can be expected to bring urban values concerning education, as well as other urban social values.

PB-224 834/2GA PC$9.25/MF$1.45
Texas Dept. of Community Affairs, Austin.
LUFKIN COMPREHENSIVE PLAN, PHASE ONE AND TWO.
Final rept.
Jan 73, 143p CPA-TX-06-1023
Prepared by Lockwood, Andrews and Newnam, Inc., Houston, Texas.

Descriptors: (*Urban planning, *Texas), Economic analysis, Neighborhoods, Land use, Residential buildings, Projects.
Identifiers: *Lufkin(Texas).

The report analyzes the economic, physical, population, neighborhood, land use, and housing conditions of Lufkin. Population and land uses are projected to 1992. A neighborhood plan is recommended along with a housing program. Goals and objectives for the plan are set and an environmental assessment of recommendations is made.

PB-224 836/7GA PC$3.00/MF$1.45
Transport and Road Research Lab., Crowthorne (England).
A SURVEY OF BUS CREW SCHEDULING PRACTICES,
R. D. Andrews. 1973, 41p* TRRL-LR-576

Descriptors: (*Bus lines, Personnel), (*Personnel, Scheduling), Surveys, Urban transportation, Computer systems programs, Cost estimates, Great Britain.

A survey of the crew scheduling practices within the bus industry was conducted. Eleven undertakings in England and Scotland participated. A wide variety of fundamentally different practices was exposed. Users of computer methods for constructing crew schedules are most likely to be large operators of intensive urban services. In addition to this use as an operational tool, a very flexible program could find wide use, for example, in estimating the cost of altering scheduling rules. Apart from SELNEC PTE, no potential users of the RAE bus crew scheduling program were identified in the course of the survey. (Author)

PB-224 844/1GA PC$5.50/MF$1.45
Texas A and M. Univ., College Station. Water Resources Inst.
DEVELOPMENT OF A DYNAMIC WATER MANAGEMENT POLICY FOR TEXAS.
Technical rept. 1 Sep 69, 31 Aug 72,
W. L. Meier, James C. Helm, and Guy L. Curry.
Jun 73, 225p TR-52 W74-00562, OWRR-B-059-TEX(3)
Contract DI-14-31-0001-3130

Descriptors: (*Water resources, Management planning), (*Multiple purpose reservoirs, Management planning), (*Texas, Water resources), Mathematical models, River basin development, Linear programming, Stochastic processes, Optimization, Computer programs, Evaluation, Construction, Systems analysis, Project planning, Water storage, Water supply.
Identifiers: Integer programming.

Optimization techniques are developed to assist in the implementation of longrange water resource plans. A stochastic programming formulation for obtaining an operating policy for single, multi-purpose reservoirs based on the continuity equation, stochastic inflow and demand, and chance constraints is developed. The chance constraints are converted to an equivalent linear deterministic set of constraints by a material balance equation. The formulation is then extended to a linked, multiple-purpose reservoir system. Both linear and quadratic objective functions are used with the equivalent linear constraint set. The problem addressed is to select reservoir storage capacities, schedule construction timing, and establish an operating policy which minimizes the total cost of a linked system of multi-purpose reservoirs. This mixed integer-continuous linear programming problem is separated into a linear programming problem and an integer programming problem using Bender's decomposition technique. The methodology is applied to Cypress Creek Basin in northeastern Texas.

PB-224 896/1GA PC$6.00/MF$1.45
Barton-Aschman Associates, Inc., Chicago, Ill.
A PUBLIC TRANSPORTATION SYSTEM FOR JACKSON, MISSISSIPPI.
Final rept.
Aug 73, 76p UMTA-MS-09-0004-73-1

Descriptors: (*Urban transportation, Management), (*Bus lines, Urban transportation), Reviews, Improvement, Routes, Scheduling, Financing, Marketing, Urban areas, Mass transportation.
Identifiers: *Jackson(Mississippi).

The purpose of the study is to analyze the transit operations and to develop a program of improvement for immediate implementation covering requirements for the next five years. Recommendations include service and equipment as well as options for the appropriate type of ownership/management, since the system has been losing money under the present system of private ownership. Specific studies concern route network revisions, the establishment of a convenient transit center, an effective marketing program, the extension of the transit service into certain outlying areas, various types of ownership, and costs of capital improvements.

PB-224 898/7GA PC$3.00/MF$1.45
Atlanta City Planning Dept., Ga.
A SURVEY OF HOUSING FORECLOSURES IN ATLANTA.
Oct 73, 14p CPA-GA-04-04-1016

Descriptors: (*Urban planning, *Georgia), (*Residential buildings, Urban planning), Surveys, Urban areas, Houses, Government, Marketing, Projects.
Identifiers: Atlanta(Georgia), *Foreclosures.

A survey of foreclosed single-family homes in moderate and middle income neighborhoods was conducted to determine the nature and extent of the problem, to make recommendations for maintenance and resale of the property and to suggest approaches which must be taken to minimize the problem. (Author)

PTB-Ra-3/GA PC$3.00/MF$1.45
Physikalisch-Technische Bundesanstalt, Brunswick (West Germany).
PARTICULATE SULPHUR CONCENTRATION IN GROUND LEVEL AIR IN NORTH GERMANY AND NORTH NORWAY.
W. Kolb. May 73, 14p
U.S. Sales Only.

Descriptors: (*German federal republic, *Air pollution), (*Norway, Air pollution), (*Sulfur, *Abundance), Particles, Seasonal variations, Surface air.

For abstract, see NSA 28 07, number 15506.

TT-70-55124/6/GA PC$3.75
Environmental Protection Agency, Washington, D.C.
AIR CONSERVATION. VOLUME 4, NUMBER 6(20), 1970.
1973, 78p
Unedited trans. of Ochrona Powietrza (Poland) v4 n6(20) 1970, by H. Massey. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Air pollution, *Periodicals), (*Poland, Air pollution), (*Zinc, Air pollution), (*Lead, Air pollution), (*Exhaust gases, Air pollution), (*Climatic changes, Air pollution), (*Sulfur dioxide, Dispersing), (*Sulfates, Dust), (*Dust, Air pollution), (*Photometry, Lead), Chemical analysis, Carbon monoxide, Motor vehicle engines, Volumetric analysis, Sampling, Translations.
Identifiers: Air pollution effects(Plants).

Contents: Zinc and lead emissions in the surroundings of a metallurgical combine and its effect on plants and soil; Measurement of the concentration of atmospheric pollution with exhaust gases in urban areas; Methods for determining lead in the atmosphere; Dust precipitation as a criterion for evaluation of public nuisance of the planned sources of emission; Effects of air pollution on the climate of towns; Findings on the dispersal of SO2 in dependence on the meteorological conditions; Determination of sulfates in atmospheric dust precipitation; Industrial briefs; Patent review.

UCRL-51405/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
AQUATIC AND ATMOSPHERIC SIMULATION.
J. B. Knox, D. M. Hardy, and C. A. Sherman. 18 Jun 73, 13p
Contract W-7405-eng-48

Descriptors: (*Air pollution, *Mathematical models), (*Water pollution, Mathematical models), A codes, Angular distribution, Computer calculations, Computer codes, Environment, Particles, Spatial distribution.

For abstract, see NSA 28 07, number 15508.

13C. Construction Equipment Materials, and Supplies

AD-768 406/1GA PC$3.00/MF$1.45
Sheffield Univ (England)
USE OF REFLECTIVE PHOTOELASTICITY TO STUDY ENVIRONMENTAL EFFECTS ON INTERNAL STRESSES IN CEMENTITIOUS MATERIALS.
Final technical rept.,
R. N. Swamy. May 73, 28p ARDG(E)-E-1488
Contract DAJA37-71-C-2600

Descriptors: (*Concrete, Photoelasticity), Stresses, Strain(Mechanics), Deformation, Loading(Mechanics), Great Britain.
Identifiers: Residual stress.

Tests are reported on the use of reflective photoelasticity to study the internal strain distribution in concrete systems under external load. The test specimens consisted of a single cylindrical aggregate core embedded in the matrix. The bond conditions of the aggregate and the gradation of the fine aggregate in the matrix were varied. The strains were measured by normal and oblique incidence methods using optical compensation. The results show that the maximum strain concentration occurred at the aggregate-matrix interface and the deformation was further enhanced when the aggregates were partially bonded. The coarser gradation of sand particles in the matrix resulted in greater non-uniformity of strains within the system. The tests emphasized the essential heterogeneity of concrete systems and the significant role of the aggregate-matrix bond on the behavior of concrete-like materials. (Author)

AD-768 450/9GA PC$4.75/MF$1.45
Dow Chemical Co Midland Mich
EXPEDIENT SURFACING MATERIALS.
Technical rept.,
H. E. Filter, and S. S. Drake. Oct 73, 159p*
AFWL-TR-73-70
Contract F29601-71-C-0092

Descriptors: (*Pavements, *Reinforced plastics), (*Laminated plastics, Pavements), Catalysts, Mechanical properties, Flammability, Peroxides, Ketones, Viscosity, Gels, Roads, Polymerization, Curing agents, Polyester plastics, Vinyl plastics.
Identifiers: Peroxy organic compounds.

A study of resin viscosity versus temperature over the range of 0 to 125F. showed the need for two resin systems to meet the requirement of 1600 cps maximum viscosity. A primary (high temperature, 32 to 125F.) resin and a secondary (low temperature, minus 15 to plus 65F.) resin were specified for development. The study of catalysis was a major effort with both the primary and secondary resin systems. One of the major discoveries of the program was the gel retardant effect of certain ketone peroxides. The primary resin system is composed of ALTEK and DERAKANE. The secondary resin system consists of COREZYN with added styrene and monochlorostyrene, and DERKANE 470. Both resin systems meet requirements for strength, cure, gel time, viscosity, combustibility, shelf life, and chemical and weather resistance for temporary roads, runways and other load bearing materials.

PB-224 511/6GA PC$2.75/MF$1.45
Bureau of Mines, Washington, D.C.
TUNNELING MACHINE RESEARCH: DEVELOPMENT OF AN EXPERIMENTAL FULL-SCALE RESEARCH ROCK CUTTING DEVICE.
Rept. of Investigations 1972-73,
Parviz F. Rad, and Robert L. Schmidt. Sep 73, 23p
BuMines-RI-7787
Prepared in cooperation with the Twin Cities Mining Research Center, Minn.

Descriptors: (*Cutters, Evaluation), (*Tunneling machines, Cutters), Rocks, Cutting, Frag, Rock properties, Fragmentation, Tunneling(Excavation), Mining engineering.
Identifiers: Rapid excavation.

The increased use of tunnel boring machines has stimulated laboratory research to optimize the cutting parameters of these machines with the objective of increasing machine efficiency and penetration rate. Laboratory-scale rock cutting experiments have succeeded in identifying many of the important parameters involved in rock-cutter interaction. Although scaling factors may be required to apply the results directly, the concepts developed can be used qualitatively as design guidelines for boring machines. The Bureau's Twin Cities Mining Research Center has recently developed a large-scale rock cutting device that will simulate many of the operating parameters of the tunnel boring machines in the laboratory under a controlled environment. The results of the experiments with this device will be directly applicable to the design of tunnel boring machines. (Author)

PB-224 564/5GA PC$4.25/MF$1.45
Transport and Road Research Lab., Crowthorne (England).
SHEAR-BOX TESTS ON GRADED AGGREGATES.
D. C. Pike. 1973, 43p TRRL-LR-583

Descriptors: (*Aggregates, Shear strength), (*Pavements, Performance), Classifications, Stresses, Shear tests, Particle size, Compacting, Standards, Moisture content, Roads, Pavement bases, Great Britain.

As part of an investigation into the mechanical properties of aggregates to develop a rational classification system, shear-box tests have been carried out on typical, graded, road aggregates at normal stresses up to 1 MN/sq m. Non-linear relations were found between peak shear stress and normal stress, with shear strengths of various aggregate types converging at higher levels of normal stress; however an arbitrary index based on logarithmic plots of the results has been developed to allow the comparison of shear strength of aggregates over a range of normal stress. The effects of aggregate type, degree of compaction, grading and moisture content upon shear strength have been quantified by correlating proportional changes in dry density produced by these variables, with proportional changes in the tangent of the angle of shearing resistance (tan phi). (Modified author abstract)

PB-224 655/1GA PC$4.25/MF$1.45
Federal Highway Administration, Washington, D.C. Materials Div.
TIME-TO-CORRISION OF REINFORCING STEEL IN CONCRETE SLABS. VOL 1. EFFECT OF MIX DESIGN AND CONSTRUCTION PARAMETERS.
Interim rept. Jul 71-Dec 72,
K. C. Clear, and R. E. Hay. Apr 73, 105p* FHWA-RD-73-32

Descriptors: (*Reinforcing steels, *Corrosion), (*Concrete, Corrosion), (*Highway bridges, Reinforcing steels), Chlorides, Electrolytic cells, Detection, Formulations, Bridge decks, Concrete slabs, Cement additives, Chromates, Silicones, Surface finishing.

The purpose of this investigation is to provide administrators and designers with factual data on which to base decisions on the type of protection to provide to bridge decks constructed in corrosive environments. Specifically, the objective is to determine the relative time-to-corrosion of reinforcing steel embedded in concrete slabs, fabricated from various mix designs and construction procedures when the slabs are subject to periodic wetting with a 3 percent NaCl solution. Surface revibration and the use of chromate and silicone admixtures were investigated. Membrane, polyethlene sheet and wet burlap curing procedures were included. Surface protective treatments included boiled linseed oil and stearate. Special treatments studied were polymer-impregnated concrete, permanent steel bridge deck forms, galvanized reinforcing steel, latex-modified concrete, epoxy-modified concrete, a low water-cement ratio portland cement concrete overlay, an expanded pumice additive, and ferro-cement. An evaluation of the electrical half-cell corrosion detection technique was also performed. (Modified author abstract) Portions of this document are not fully legible.

PB-224 817/7GA PC$3.00/MF$1.45
Transport and Road Research Lab., Crowthorne (England).
THE PERFORMANCE OF CLARK A SCHEID DV 60 6.9 MG DOUBLE VIBRATING ROLLER IN THE COMPACTION OF SOIL,
A. C. Toombs. 1973, 18p TRRL-LR-590

Descriptors: (*Compaction equipment, Performance tests), (*Soil compacting, *Vibratory compacting), Soils, Soil analysis, Vibrators(Machinery), Roll compacting, Great Britain.
Identifiers: DV 60 compaction equipment.

The report describes an investigation into the performance of a Clark Scheid DV 60 6.9 Mg double vibration roller in the compaction of a heavy clay, a sandy clay, a well-graded sand, a gravel- sand-clay and a uniformly graded fine sand. The results show that, when using a speed of travel of 2.2 km/h, 3 passes of the machine were required to achieve a satisfactory state of compaction with 180mm-thick compacted layers of the cohesive and well-graded granular soils, and 2 passes were required with 300mm-thick compacted layers of the uniformly graded fine sand. The roller would, therefore, under these conditions, be capable of an output of compacted soil of about 140 cubic meters/h with cohesive and well-graded granular materials, and about 340 cubic meters/h with uniformly graded fine sand. Tests with the well-graded sand indicated that variations in the speed of travel and thickness of compacted layer would give rise to variations in output of compacted soil in the range 100 to 200 cubic meters/h. (Author)

13D. Containers and Packaging

AD-768 721/3GA PC$3.00/MF$1.45
Army Construction Engineering Research Lab Champaign Ill
STIFFNESS MATRIX REDUCTION FOR LARGE STRUCTURAL SYSTEMS USING CHOLESKY DECOMPOSITION.
Interim rept.,
Gordon Holze. Oct 73, 29p Rept no. CERL-IR-S-24

Descriptors: (*Containers, Structural properties), Matrix algebra, Loading(Mechanics), Computer programs.
Identifiers: *Stiffness methods, Matrix methods, *Structural analysis, Degrees of freedom, *Shipping containers, Finite element analysis, Cholesky decomposition.

Using a method similar to that proposed by Rosen and Rubinstein, a computer program was written to reduce the stiffness matrix of a multi-degree of freedom system down to an equivalent stiffness matrix involving a smaller number of degrees of freedom. Since this method uses Cholesky decomposition instead of the more common matrix inversion, it is useful for substructure problems in which a large number of degrees of freedom are to be condensed and eliminated. The computer program in Appendix B is most efficient when used for a large degree of freedom system with a sparse stiffness matrix. An example problem is explained in Appendix C to demonstrate the use of the program. (Author)

AD-768 725/4GA PC$3.00/MF$1.45
Forest Products Lab Madison Wis
SHOCK CUSHIONING BY CORRUGATED FIBERBOARD PADS TO CENTRALLY APPLIED LOADING.
Forest Service research paper,
R. K. Stern, and C. A. Jordan. 1973, 50p* Rept no. FSRP-FPL-184

Descriptors: (*Packing materials, *Fiberboard), Sandwich panels, Shock resistance, Impact shock, Impact tests, Loading(Mechanics), Configuration.
Identifiers: Corrugating.

Packages are frequently designed so that only the smaller projections of items contact the protective pads, and the package designer is uncertain about the shock-cushioning ability of centrally loaded corrugated fiberboard pads (as happens in cushioning of items having load-bearing projections of different sizes). FPL (Forest Products Laboratory) quantitatively defined this relationship: The optimum effectiveness of partially loaded corrugated fiberboard pads as shock cushions decrease with reduction of the bearing area of the item against the pad. Additionally, the study determined that A-flute pads perform substantially better as shock cushions than B-flute pads when the only difference between the pads involves the geometry of the corrugations. (Author)

AD-768 726/2GA PC$3.00/MF$1.45
Forest Products Lab Madison Wis
EVALUATION OF METHODS OF ASSEMBLING PALLETS.
Forest Service research paper,
R. S. Kurtenacker. 1973, 31p Rept no. FSRP-FPL-213

Descriptors: (*Pallets, Assembling), Manufacturing methods, Mechanical fasteners, Adhesives, Wood, Acceptability.

The performance of pallets assembled by various methods--with nails, staples, or synthetic elastomeric adhesives--was evaluated by testing pallet corners statically and dynamically (impact). In addition to the assembly methods, other variables investigated were species and moisture content at time of assembly. The species were red oak, Douglas-fir, hickory, yellow-poplar, and aspen. Moisture contents at time of assembly ranged from 12 percent (dry) to more than 30 percent (green). Hardened pallet nails, slightly thinner and shorter than the standard helically threaded pallet nail, performed better than did the standard nail, especially in the impact tests of pallet corners. Results of tests of both the corners and the complete pallets confirmed that the slender nails were superior to the standard pallet nail. Pallets assembled with pneumatically driven plastic-coated staples (2-1/2-in. legs, 15-gage wire) performed adequately as did the pallets assembled with two of four synthetic elastomeric adhesives. (Author)

AD-768 729/6GA PC$3.75/MF$1.45
Army Natick Labs Mass
PROCEEDINGS OF SYMPOSIUM ON FLEXIBLE PACKAGING FOR HEAT-PROCESSED FOODS, HELD IN HOLIDAY INN, HILLSIDE, ILL. ON NOBEMBER 9-10, 1972.
Sep 73, 100p*

Descriptors: (*Packaging, *Food), Films, Plastics, Flexural strength, Military rations, Processing, Heat, Packing materials, Symposia, Reliability.
Identifiers: Flexible packaging.

Contents:
Bakery items in flexible packages;
Reliability of package forming and filling;
Feasibility of retorting foods in flexible packages;
Test procedures and performance values required to assure reliability.

N73-31799/2GA PC$3.75/MF$1.45
Naval Ordnance Lab., White Oak, Md.
CARBON FIBER INTERNAL PRESSURE VESSELS.
Technical Report, Jan. - Dec. 1972.
R. A. Simon. 17 Jul 73, 32p NASA-CR-121138, NOLTR-73-60
NASA ORDER C-10360-B

Descriptors: *Carbon fibers, *Epoxy resins, *Pressure vessels, Filaments, Linings, Room temperature, Strands.

For abstract, see STAR 1122

PAT-APPL-280032/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
HEATER-MIXER FOR STORED FLUIDS.
Patent Application.
T. N. Canning. Filed 11 Aug 72, 9p NASA-CASE-ARC-10442-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cryogenic fluid storage, *Heating equipment, Cylindrical chambers, Fluid mechanics, Inventions, Mixers, Patent applications.

A fluid storage vessel is described for containing cryogenic fluids including an auxiliary chamber within the storage vessel. The auxiliary chamber is connected in fluid communication with the main storage vessel by means of a jet nozzel. The wall of the auxiliary chamber is heat cycled to produce a corresponding expansion and contraction of the fluid within the auxiliary chamber to produce heating and mixing of the stored fluid by means of jetting the expanded fluid to and fro relative to the stored fluid contents of the vessel.

13E. Couplings, Fittings, Fasteners, and Joints

AD-768 396/4GA PC$2.75/MF$1.45
California Univ Los Angeles School of Engineering and Applied Science
RECENT DEVELOPMENTS IN ACOUSTIC EMISSION AS APPLIED TO WELDING DEFECTS,
Kanji Ono. Sep 73, 22p* Rept no. UCLA-ENG-7375
Contract N00014-69-A-0200-4031

Descriptors: (*Welds, Acoustic properties), Nondestructive testing, Fracture(Mechanics), Defects(Materials).
Identifiers: Acoustic emission.

Recent developments in acoustic emission testing as related to welded structures are presented, focusing the attention to signal characterization, fracture induced acoustic emission, and large scale testing to locate flaws. Successful applications as well as the areas in need of further research are identified. (Author)

AD-768 689/2GA PC$3.75/MF$1.45
Auburn Univ Ala
STUDY OF THE ONSET OF PERMANENT DEFORMATION IN STRUCTURALLY BONDED JOINTS.
Final rept. 19 Nov 71-19 Apr 73,
Wartan A. Jemian, and Roy C. Wilcox. Aug 73, 84p
Contract DAAH01-72-C-0258

Descriptors: (*Bonded joints, Deformation), Fracture(Mechanics), Crack propagation, Creep, Adhesives, Epoxy plastics, Aluminum alloys.
Identifiers: Aluminum alloy 2024.

Adhesive bonding is a standard production method in aircraft construction the elastic sample compliance vs. crack length curve for adhesive bonded samples in the lap-shear configuration was found to have a positive curvature and an increasing slope with increasing crack length. The effects of various sample parameters on the compliance variation curve were determined. Sample compliance is a linear function of adhesive thickness and the sample stiffness depends directly upon overlap length, adherend thickness, adhesive and adherend moduli, and sample width. This research was conducted by experimentation and finite element computation. The materials were EPON 828/D, EPON 901/B-1, and EPON 901/B-3 adhesives and aluminum alloy 2024-T4 and alclad alloy 2024-T3 adherends. Fracture surfaces were studied by direct observation and by scanning electron and replica electron microscopy. Features of plastic flow, slow and rapid crack extension were ovserved. A standard procedure for fracture toughness testing with samples in the lap-shear configuration was outlined. (Modified author abstract)

BDX-613-561(Rev.)/GA PC$5.00/MF$1.45
Bendix Corp., Kansas City, Mo.
NONDESTRUCTIVE TESTING OF PERCUSSIVE ARC WELDS.
K. O. Cox. Jul 73, 57p
Contract AT(29-1)-613

Descriptors: (*Welded joints, *Ultrasonic testing), (*Connectors, Welded joints), Arc welding.

For abstract, see NSA 28 07, number 17711.

N73-31447/8GA PC$8.25/MF$1.45
Technische Universitaet, Brunswick (West Germany). Fakultaet fuer Maschinenbau und Elektrotechnik.
MICRODEFFECTS IN WELDING MATERIALS ON UNALLOYED ELECTRODE RODS MIKROFLECKE IM SCHWEISSGUT UNLEGIERTER STABELEKTRODEN.
Ph.D. Thesis.
F. Potthoff. 1972, 122p
Language in German.

Descriptors: *Electrodes, *Microstructure, *Weld strength, *Weld tests, *Welded joints, Materials tests, Metallography, Photomicrographs.

For abstract, see STAR 1122

N73-31453/6GA PC$4.00/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
METAL-CERAMIC JOINTS METALL-KERAMIK-VERBINDUNGEN.
H. Schmidt-bruecken, and W. Schlapp. Jan 72, 38p FTZ-A-97-TBR-2
Language in German.

Descriptors: *Ceramic bonding, *Metal surfaces, Ceramic coatings, Enthalpy, Explosive welding, Metal oxides, Soldering.

For abstract, see STAR 1122

N73-31780/2GA PC$4.75/MF$1.45
Wilpac Mfg. Co., El Cojon, Calif.
ZERO LEAKAGE SEPARABLE AND SEMIPERMANENT DUCTING JOINTS.
H. T. Mischel. 1973, 51p NASA-CR-124386, EDR-20042
Contract NAS8-28159

Descriptors: *Ducts, *Joints (Junctions), *Space shuttles, Leakage, O ring seals, Stresses, Systems engineering, Temperature effects.

For abstract, see STAR 1122

PATENT-3 497 846/GA Not available NTIS
Department of the Navy Washington D C
MAGNETIC ANCHOR FOR CURVED AND IRREGULAR SURFACES.
Patent,
Karl H. Keller. Filed 27 Dec 67, patented 24 Feb 70, 4p Rept nos. PAT-APPL-693 806,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Fastenings, Magnets), Ferromagnetic materials, Colloids, Hoists, Curved profiles, Effectiveness.
Identifiers: PAT-CL-3355-296.

The patent relates to the attachment of flexible bag like members to the pole filling the bags with ferromagnetic particles in a suspension of oil or other suitable fluid to improve the lifting effectiveness of the magnet when engaging curved or irregular surfaces. When used with a permanent magnet, means must be provided to remove the magnetic field from the particles until they have conformed to the surface.

PATENT-3 521 443/GA Not available NTIS
Department of the Navy Washington D C
HOOK FOR CARGO TIE-DOWN.
Patent,
Leo Dragonuk. Filed 23 May 68, patented 21 Jul 70, 4p Rept nos. PAT-APPL-731 530,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Hooks, *Patents), Release mechanisms, Chains, Anchors(Structural), Cargo.
Identifiers: PAT-CL-59-86.

The patent describes a hook adapted for use with link chains for establishing quickly releasable tie-down arrangements. The hook has a body portion keyhole-shaped aperture adapted for locking engagement with a link chain and an obtusely inclined, protruding hook portion engageable with a chain link. It has a spring-loaded keeper which is actuated by a lanyard to release a link retained by the hook portion.

PATENT-3 749 362/GA Not available NTIS
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
FASTENER STRETCHER.
Patent.
J. W. Oconnor, and V. C. Orem. Patented 31 Jul 73, 7p NASA-CASE-GSC-11149-1,
Misc-Filed 9 Apr. 1971 Supersedes N71-34422 (09 - 21, p 3432).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Bolts, *Nuts (Fasteners), *Stretching, *Structural members, Patents, Tensile stress, Torque.

A description is given of a fastener stretcher used to apply a substantial pure axial tensile force to a structural bolt or similar fastening element. The system is comprised of a pair of telescoping elements, one of which is temporarily secured to the bolt. By spreading the telescoping elements axially, the bolt is tensioned axially to permit a nut or the like to be threaded with a minimum of torque; when the elements are then removed from the bolt, the axial forces on the bolt are taken up by the nut to retain the bolt in its stressed state.

PB-224 514/0GA PC$2.75/MF$1.45
Bureau of Mines, Washington, D.C.
ESTABLISHING STANDARDS FOR EFFECTIVE WIRE ROPE CLIP INSTALLATION.
Rept. of investigations,
Robert I. Fujimoto. Sep 73, 25p BuMines-RI-7789
Prepared by Bureau of Mines, Denver, Colo. Denver Technical Support Center.

Descriptors: (*Clips, Wire rope), Fasteners, Installing, Standards, Clamps.
Identifiers: Wire rope clips.

The work described was conducted to develop standards for the application of wire rope clips on wire rope. These standards include optimum number of clips and clip nut torques for wire rope sizes 1/4 through 2-1/4 inches when used for forming an eye attachment in wire rope. Wire rope test specimens with clip attachments were load tested on tensile testing machines to determine an effective combination of clip nut torques and number of clips for each size of wire rope to develop efficiencies above 90 percent of the catalog ultimate rope strength. (Author)

13F. Ground Transportation Equipment

N73-30468/5GA PC$3.50/MF$1.45
Laboratorium fuer Betriebsfestigkeit, Darmstadt (West Germany).
ANALYSIS OF A STRESS-TIME HISTORY MEASURED UNDER OPERATIONAL CONDITIONS BY MEANS OF POWER SPECTRAL DENSITY BESCHREIBUNG EINER IM FAHRBETRIEB GEMESSENEN BEANSPRUCHUNGS-ZEIT-FUNKTION MIT HILFE DER SPEKTRALEN LEISTUNGSDICHTE.
O. Buxbaum. Oct 72, 29p LBF-TB-102
Language in German.

Descriptors: *Automobiles, *Power spectra, *Stress-strain-time relations, *Surface roughness effects, *Suspension systems (Vehicles), Data recording, Frequency distribution, Magnetic recording, Maneuvers, Random vibration, Roads, Stress analysis, Vehicle wheels.

For abstract, see STAR 1121

PAT-APPL-393523/GA PC$3.50/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
MATERIAL SUSPENSION WITHIN AN ACOUSTICALLY EXCITED RESONANT CHAMBER.
Patent Application.
T. G. Wang, M. M. Saffren, and D. D. Elleman.
Filed 31 Aug 73, 27p NASA-CASE-NPO-13263-1,
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Acoustic propagation, *Electroacoustic transducers, *Sound waves, *Space manufacturing, *Wave generation, Patent applications, Systems analysis, Wave interaction.

A device for use in a spacecraft, where there are only small acceleration or gravity forces, to suspend an object at the center of a chamber while manufacturing operations are performed on the object is described. The system holds an object at the center of a chamber of rectangular cross-section, by the use of three acoustic transducers that generate sound waves. The frequencies of the sound waves are chosen so that a standing wave pattern is established. This standing ave pattern produces a pressure minimum at the center of the chamber, so that the object tends to remain there without any need for physical contact from a support. This permits manufacturing operations such as the melting of materials without contamination from contact with furnace walls.

PAT-APPL-393525/GA PC$3.25/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
APPARATUS FOR FORMING DRIVE BELTS.
Patent Application.
A. Topits, Jr.. Filed 31 Aug 73, 23p NASA-CASE-NPO-13205-1,
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Belts, *Machinery, *Manufacturing, *Polyesters, Patent applications, Rollers, Rotating shafts.

An apparatus for manufacturing belts is reported with relatively movable rollers that are mounted in an oven. A belt blank of a thin polyester film is rotated on the rollers as heat is applied. Four rollers, each mounted on a separate roller assembly, are movable along appropriate tracks while a fifth centrally located roller is stationary. A pair of DC motors are operatively connected to a speed reduction gear assembly to provide a pair of rotating drive shafts that extend into the oven. One rotating shaft drives all of the rollers through a rotational gear assembly while the other drive shaft is capable of positioning the movable rollers through respective rotating threaded shafts. Control devices are provided for controlling the motors while measuring devices are operatively connected to the positional drive shaft to indicate the position of the rollers.

PB-223 725/3GA PC$3.50/MF$1.45
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
WET TRACTION TEST PROGRAM.
Final rept.,
R. E. Wild. Aug 73, 53p* UM-HSRI-PF-73-3 DOT-HS-800 917
Contract DOT-HS-031-2-283

Descriptors: (*Automobile tires, *Traction), Concrete pavements, Flexible pavements, Standard deviation, Skid resistance, Braking, Safety, Friction factor.
Identifiers: *Traction grading, Consumer relations, Consumer safety.

The report describes a test in which 86 tires (2 each of 43 different types representing 90% of the O.E. population) were measured for longitudinal and lateral traction capability on 3 different wetted surfaces. The resulting data was subjected to a simple but thorough statistical analysis. Findings of general interest emerged showing the fallibility of the skid number for characterizing a tire-pavement combination, the independent nature of lateral traction with respect to longitudinal traction, and indications of the effects on traction of tire diameter and load rating. Traction uniformity on concrete between identical tires was found to be excellent, while the traction differences on concrete between tires of the same size but of different manufacture were found to be statistically significant. (Author)

PB-223 937/4GA PC$8.00/MF$1.45
Texas Transportation Inst., College Station.
COMPARISONS OF FULL-SCALE EMBANKMENT TESTS WITH COMPUTER SIMULATIONS. VOLUME 1. TEST RESULTS AND COMPARISONS.
Research rept. Sep 68-Dec 72,
Hayes E. Ross, Jr., and Edward R. Post. Dec 72, 119p TTI-2-5-69-140-7

Descriptors: (*Motor vehicles, Crash tests), (*Highways, Embankments), Slopes, Roads, Road tests, Automobiles, Motor vehicle accidents, Design criteria, Computerized simulation.

Six full-scale tests of an instrumented automobile were conducted on an embankment. The tests were conducted for various combinations of vehicle encroachment speed and encroachment angle. The embankment, which was on Texas State Highway 21, consisted of a 3.5:1 side slope and a relatively flat bottom ditch approximately 20 feet below the paved roadway. Each test was simulated by the Highway-Vehicle-Object-Simulation-Model (HVOSM), a computer program, and the results were then compared with the measured test results. With the exception of the tests in which suspension failures occurred in the test car, the correlation between the measured and predicted data was good. Volume One describes the study and includes the test results and comparisons. (Author)

PB-224 206/3GA PC$4.50/MF$1.45
Dynamic Science, Phoenix, Ariz.
CRASH INJURY REDUCTION AND POST-CRASH FACTORS EVALUATIONS - GM-08 AND GM-09 - SIXTY-MPH FRONT-TO-READ IMPACT.
Final rept.
Aug 73, 130p* 2310-73-40 DOT-HS-800-910
Contract DOT-HS-046-2-468

Descriptors: (*Automobiles, *Crash tests), (*Safety engineering, Automobiles), (*Anthropometry, *Safety devices), Impact tests, Nondestructive tests, Evaluation, Fire hazards, Rescue operations, Escape systems, Collision research, Design standards.
Identifiers: *Crashworthiness.

The report presents the results of a 60-mph front-to-rear crash test between two General Motors Experimental Safety Vehicles conducted for the National Highway Traffic Safety Administration. The overall purpose of the program under which this test was conducted is to perform quantitative non-destructive and crash tests on ESVs manufactured by General Motors Corporation and Ford Motor Company. Primary objectives of the test reported herein were to determine the occupant and structural responses of the striking vehicle and to acquire limited data on the responses of the struck vehicle. A post-crash factors evaluation was also performed on the striking vehicle to evaluate fire hazard, rescue, and emergency egress.

PB-224 207/1GA PC$4.50/MF$1.45
Transportation Systems Center, Cambridge, Mass.
MBTA GREEN LINE TESTS-RIVERSIDE LINE, DECEMBER, 1972. VOLUME I. TEST DESCRIPTION.
Final rept.,
George W. Neat. Sep 73, 133p DOT-TSC-UMTA-73-9-Vol-1, DOT-TSC-UMTA-74-1-Vol-1

Descriptors: (*Rapid transit railways, Research), Projects, Noise(Sound), Electron tunneling, Acceleration, Vehicles, Railroad tracks, Measurement, Safety engineering.

The Urban Rail Supporting Technology Program emphasizes three major task areas; facilities development, technology development, and test program development. The test program development is composed of three sub-areas; vehicle testing, ways and structures testing, and track geometry measurement. The report presents the technical methodology, data samples, and results of tests conducted on the Massachusetts Bay Transit Authority (MBTA) Green Line in December, 1972 prior to initiation of the Green Line refurbishment effort. An instrumented revenue type car was used for the measurement of track geometry, ride roughness, and interior noise. Actual car speed was approximately the same as normal revenue speed. The objectives of the tests were to identify critical track sections for improvement to quantify the benefits produced by the track rehabilitation program, and to provide data for Transportation Systems Center's development of an advanced track geometry measurement system.

PB-224 220/4GA PC$3.50/MF$1.45
Marquette Univ., Milwaukee, Wis. Urban Transportation Program.
THE PROBLEM OF PERSONAL SECURITY IN BUSES ALONG A TRANSIT ROUTE IN MILWAUKEE AND ITS EFFECTS ON RIDERSHIP.
Final rept.,
Forrest P. Roemer, and Kumares C. Sinha. Jul 73, 68p*

Descriptors: (*Urban transportation, *Security), (*Public opinion, *Surveys), Bus lines, Wisconsin, Questionnaires, Traffic safety, Mass transportation.
Identifiers: Milwaukee(Wisconsin), Personal security.

The study investigates the relationship between the decrease in transit passengers and the effect of experiences and beliefs of riders and potential riders relative to incidents of on-bus crime and vandalism. An attempt is made to identify a relationship between such beliefs and experiences on passenger usage as related to the socioeconomic backgrounds of the respondents. The investigation revealed that transit crime and vandalism have an adverse effect on passenger usage, and that the effect becomes more pronounced as the distance from the position on the route decreases relative to the central city. However, it was found that service factors such as frequency of service, fare level, convenience of route, and travel time proved to be more critical for transit usage than personal security. A list of references and sample questionnaires are included. Portions of this document are not fully legible.

PB-224 319/4GA PC$7.00/MF$1.45
Calspan Corp., Buffalo, N.Y.
BASIC RESEARCH IN CRASHWORTHINESS II - LARGE DEFLECTION COMPUTERIZED ANALYSIS OF RATE SENSITIVE ELASTO-PLASTIC FRAME STRUCTURES.
Interim technical rept.,
Rong-chung Shieh. Aug 73, 310p CALSPAN-YB-2987-V-11 DOT-HS-800 884
Contract FH-11-7622

Descriptors: (*Automobiles, Structural properties), (*Safety engineering, Automobiles), Computer programming, Dynamic structural analysis, Deformation, Deflection, Strains, Chassis, Automobile bodies, Algorithms, Bending, Stresses, Runge-Kutta method, Collision research, Design standards, Computer programs.
Identifiers: *Crashworthiness, Computer aided analysis, LDDAFS 2 computer program.

A general computerized study, including the effects of axial forces and material strain rate sensitivity on the dynamic plastic behavior, for collapsing plane frame structures involving large deflections is presented within the context of elementary beam theory. The nonlinear initial value problem is formulated through use of the matrix displacement method of rigid frame analysis, and a computational algorithm based on the Runge-Kutta step by step integration and linear interpolation techniques for finding a special event (plastic loading or unloading initiation) time is developed. A computer program, designated LDDAFS II, is developed for the special case of non-interaction between the axial force and bending moment at a beam cross section. Three example problems of which one is related to automobile crashworthiness of a special automobile front structure are presented.

PB-224 413/5GA PC$4.25/MF$1.45
Minnesota Univ., Minneapolis. Program in Urban Transportation.
A METHODOLOGY FOR THE LOCATION OF PERSONAL RAPID TRANSIT FACILITIES.
Final rept.,
Gerald Olafson. Aug 73, 101p* UMTA-MN-11-0003-73-2
Contract UMTA-URT-3

Descriptors: (*Rapid transit railways, Design), Networks, Methodology, Automation, Feed back control, Simulation, Evaluation, Urban areas, Projects, Minnesota, Urban transportation.
Identifiers: PRT(Personal Rapid Transit systems), Personal rapid transit systems, Computerized simulation.

The study represents an effort to develop a methodology to assist planners and engineers in the design of first-cut Personal Rapid Transit networks. Personal Rapid Transit systems consist of small, automatically controlled vehicles utilizing their own guideway and off-line stations. Most previous network generation models have not demonstrated their usefulness for such systems. An index is defined for the study called the Opportunity Index by which the network is evaluated and compared to the present auto/street system. It consists of a modification of the standard accessibility index. The methodology is first developed in a general way and the rationale for the Opportunity Index is presented. The method is then demonstrated by designing a PRT network for a section of Minneapolis. (Author)

PB-224 468/9GA PC$5.25/MF$1.45
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
INVESTIGATION OF SWITCHING MODES FOR A THREE-BEAM HEADLAMP SYSTEM,
Rudolf G. Mortimer, and David V. Post. 4 Jun 73, 64p UM-HSRI-HF-73-16

Descriptors: (*Automobiles, *Headlamps), Switching, Questionnaires, Visibility, Glare, Evaluation, Efficiency, Night.

The objective of the study was to obtain information which is basic to the development of three-beam headlamp switching methods. The conditions in which drivers used each of the beams while driving a car equipped with a three-beam headlamp system, and the sequences of switching between the beams, were measured. Questionnaire were also used to provide information of differences between two- and three-beam system beam usage, and ratings of glare and visibility. A set of statements of human factors control-display design principles were compiled to devise a rating scale for the preliminary evaluation of switching concepts. It is concluded that drivers consider the mid beam to offer a worthwhile increase in visibility, compared to the low beam, and would use it in many night driving conditions. (Author)

PB-224 568/6GA PC$4.50/MF$1.45
Rensselaer Polytechnic Inst., Troy, N.Y. School of Engineering.
MASS TRANSIT TECHNOLOGY: A COMPREHENSIVE SURVEY OF VEHICULAR HARDWARE.
Final rept.,
Keith S. Sibley. Jun 73, 132p*
Grant NSF-GT-32162
Prepared in cooperation with New York State Assembly Scientific Staff, rept. no SS-304. Sponsored in part by Urban Mass Transportation Administration. Master's thesis.

Descriptors: (*Mass transportation, Surveys), (*Vehicles, Mass transportation), Reviews, Urban transportation, Urban planning, Market research, Land use, Financing.

An inventory of mass transit hardware has been compiled, tabulated in an organized format and classified first according to the most appropriate functional usage and then according to physical attributes. Information conveyed includes background data, vehicle description, vehicle performance, system characteristics, land use, costs and considerations, significant advantages and disadvantages and illustrations. The inventory is to be reviewed not only as a collection of specific transit vehicles and example systems but also with attention given to the advances in vehicle component technology represented therein.

PB-224 573/6GA PC$4.50/MF$1.45
Minnesota Univ., Minneapolis. Program in Urban Transportation.
VEHICLE SCHEDULING AND CONTROL IN PERSONAL RAPID TRANSIT SYSTEMS.
Final rept.,
Harold L. York, W. L. Garrard, and A. L. Kornhauser. Sep 73, 136p* UMTA-MN-11-0003-73-3

Descriptors: (*Rapid transit railways, Scheduling), Synchronism, Automation, Feedback control, Acceleration, Position(Location), Mathematical models, Simulation, Urban transportation, Mass transportation.
Identifiers: PRT(Personal Rapid Transit systems), Personal rapid transit systems, Computerized simulation.

The report consists of three separate studies. The first study discusses a PRT system operating under quasi-synchronous control and demonstrates the feasibility and limitations of this strategy in a very high-demand situation using a computer simulation. The second paper applies optimization theory to the design of feedback control systems for high-capacity automated transit systems. Resulting controllers minimize headway and velocity errors without causing passenger discomfort. Significant dynamic response is achieved during normal mainline operation, merging and demerging, maneuvering and emergency stopping. The third paper discusses the theory of optimal control as applied to the design of feedback systems for longitudinal control of automated transit vehicles.

PB-224 596/7GA PC$41.75/MF$1.45
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM-AUTOMOTIVE TIRES. GOODYEAR TIRE AND RUBBER CO.
21 Jul 72, 793p FTC 722-3193/Goodyear

Descriptors: (*Tires, *Publicity), (*Manufacturers, Tires), Automobile tires, Safety, Stability, Traction, Treads, Performance, Strength, Braking, Polyester fibers, Glass fibers, Acceleration, Nylon, Rayon.
Identifiers: *Truth in advertising, Goodyear Tire and Rubber Company, Marathon 78 tires, Kelly-Springfield tires, Goodyear tires.

Documentation is submitted in support of various claims concerning stability, mileage and traction of Marathon 78 tire; cost, traction, cornering ability and construction of Kelly-Springfield Renown tires; extra strength, preferrance and high performance of Power Belt Polyglas and Wide Tread GT tires; stability, steering control and configuration, test procedures, their results, comparative traction performance and effectiveness of Custom Power Cushion Polyglas tires; safety of Sure Grip IV tires; wearing length of Polyglas tires, braking and cornering performance of Custom Wide Tread 70 and Polyglas GT 60 tires; strength and effectiveness of nylon and rayon, bonding potential traction, strength and mileage of Custom Wide Tread Polyglas tires; penetration protection, long-wear and smoothride of Double Eagle Polysteel tires; mileage, strength, long wear and long lasting resistance to impact and penetration of Custom Power Cushion Polysteel tires. Portions of this document are not fully legible.

PB-224 643/7GA PC$3.00/MF$1.45
Dynamic Science, Phoenix, Ariz.
SUMMARY OF GENERAL MOTORS EXPERIMENTAL SAFETY VEHICLE TESTS.
Final rept. Jul-Dec 72.
Aug 73, 37p* 2310-73-43 DOT-HS-800-909
Contract DOT-HS-046-2-468

Descriptors: (*Automobiles, *Crash tests), (*Safety engineering, Automobiles), Design standards, Accident prevention, Safety devices, Collision research, Braking, Maneuverability, Impact tests.
Identifiers: *Safety cars.

The report summarizes the results of testing four General Motors (GM) Experimental Safety Vehicles (ESV's). Two of the vehicles (GM-08 and GM-09) were fully functional and were utilized in all phases of the test program. The other two vehicles (GM-06 and GM- 07) had previously been crash tested by GM during the development program and were suitably refurbished for futher crash testing. The purpose of the test program was to conduct quantitative nondestructive and crash tests on the ESVs to determine their compliance with the Government performance specifications. The overall evaluation of the GM vehicles involved the following four tasks: Task I--Evaluation of Design Requirements; Task II--Accident Avoidance Evaluations; Task III--Crash Injury Reduction Evaluations; Task IV--Post-Crash Factors Evaluations.

PB-224 700/5GA PC$6.50/MF$1.45
Denver Research Inst., Colo.
DYNAMICS OF MOTORCYCLE IMPCAT. VOLUME III. COMPUTER SIMULATION OF THREE-DIMENSIONAL MOTION OF MOTORCYCLE.
Final rept.Jul 71-Mar 73,
R. E. Knight, and H. C. Peterson. Aug 73, 280p
DRI-2614 DOT-HS-800-908
Contract DOT-HS-126-1-186
See also Volume 2, PB-204 998.

Descriptors: (*Motorcycles, *Collision research), (*Safety engineering, Motorcycles), (*Anthropometry, Safety engineering), Dynamics, Motor vehicles accidents, Mathematical models, Equations of motion, Rotation, Computer programs, FORTRAN, Safety devices, Computerized simulation.
Identifiers: Air bag restraint systems, *Motorcycle accidents.

The volume presents a digital computer simulation of the three-dimensional post-impact motion of a motorcycle. The motorcycle model has nine degrees of freedom (DOF) (three rigid body translations, three rigid body rotations, and three internal DOF). The three internal DOF are rotation of the steering assembly, rotation of the front wheel, and rotation of the rear wheel. The mathematical modeling and computer simulation reported were conducted in conjunction with the motorcycle crash tests done and reported in Volume II of this report. The equations of motion for the nine DOF system are derived; the method of solving these equations and the associated FORTRAN IV computer program are described. A listing of the program and detailed instructions for preparing the data input are given. Test-case results are included along with the plotted results obtained on a Calcomp Plotter. A significantly simpler eight DOF program is also described in detail; this simulation does not include rotation of the steering assembly. Results of a parametric study of 2D motion of a motorcycle/airbag/point-massrider are included.

PB-224 747/6GA PC$4.25/MF$1.45
Faucett (Jack) Associates, Inc., Chevy Chase, Md.
ESTIMATION OF OUTPUT MEASURES FOR TRANSPORTATION SECTORS: 1947 AND 1958.
Final rept.,
Carl Woehicke. Aug 73, 122p JACKFAU-73-54C
Contract DOT-OS-20096

Descriptors: (*Transportation, Statistical data), (*Economic surveys, Transportation), Tables(Data), Methodology, Marine transportation, Civil aviation, Pipeline transportation, Cargo transportation, Travel, International trade, Urban transportation, Buses(Vehicles).

The report provides detailed historical estimates of private and for-hire transportation activities for 1974 and 1958. The detail matches that of other work on the Department of Transportation input-output model for 1965 and 1970 with projections to 1980. Thus, the data are useful for developing trends which can be compared with projected future growth. The report is also valuable in that it presents data sources and methodologies which can be used in further developing historical series on transportation activities.

PB-224 774/0GA PC$3.00/MF$1.45
Transport and Road Research Lab., Crowthorne (England).
TYRE FAILURES ON PART OF M5 MOTORWAY,
R. W. Lowne. 1973, 13p TRRL-LR-585

Descriptors: (*Tires, Failure), Degradation, Blowouts, Treads, Tire tubes, Tubeless tires, Automobiles, Motor trucks, Great Britain, Accident investigations.
Identifiers: M5 highway, Retread tires.

The West Mercia Constabulary collected data on 310 tire failures observed between junctions four and eight on the M5 motorway between September and November 1971. The data are analysed in this report. Retreaded tires were found to fail more often than original treaded tires and heavy goods vehicles were found to suffer tire failure more frequently than private cars although this tended to lead to fewer accidents than with cars. About two percent of all tire failures led to injury accidents and three percent to all accidents that were reported. The results are in agreement with a previously reported result that about one sixth of all injury accidents have tire failure as a major contributary factor. The risk of failure increased with tire wear for car tires. (Author)

PB-224 837/5GA PC$4.75/MF$1.45
Transport and Road Rsearch Lab., Crowthorne (England).
BUS PRIORITY: PROCEEDINGS OF A SYMPOSIUM HELD AT TRRL, 1972.
1973, 154p* TRRL-LR-570

Descriptors: (*Buses(Vechicles), *Urban transportation), (*Vechicular traffic, Management), Meetings, Mass transportation, Reviews, Great Britain, Proceedings.
Identifiers: Exclusive bus lanes, Bus priority systems.

The paper outlines the background, development, and prospects for bus priority schemes in Great Britain. It does not seek to describe individual schemes in detail but rather to assess the overall state-of-the art of the subject.

PB-224 878/9GA PC$5.50/MF$1.45
AiResearch Mfg. Co., Torrance, Calif.
LINEAR INDUCTION MOTOR RESEARCH VEHICLE. SPEED UPGRADING TESTS.
Final rept. 26 Jun-2 Aug 72,
G. O. D'Sena, and J. E. Leney. Jun 73, 207p* 72-8857 FRA-ORD/D-74-1
Contract OHSGT-7-35399
See also report dated Oct 71, PB-212 041.

Descriptors: (*Rapid transit railways, Performance evaluation), (*Electric propulsion, *Induction motors), Vehicle wheels, Gas turbine power generation, Electric power transmission, Suspension systems(Vehicles), Undercarriage, Drag, Evaluation.
Identifiers: LIM(Linear Induction Motors), Linear induction motors, Turboalternators.

A series of linear induction motor research vehicle (LIMRV) runs were conducted at the High Speed Ground Test Center on the 6.2-mile test track. These runs were made primarily to evaluate the dynamic performance of the vehicle at speeds up to the maximum achieved, 187.9 mph. The vehicle was equipped with instrumentation that measured accelerations and displacements. Of particular interest were the motion of the trucks and suspension, and the LIM guidance system. The initial truck dynamics data evaluation indicates an increase in conicity resulting from a narrow band of wheel treadwear. Since the next series of tests will be conducted with new wheels, the problem at least initially will not be significant. Other tests run during this program provided acceleration and braking profiles. Also, some LIM electrical performance data was recorded and evaluated. (Author)

13G. Hydraulic and Pneumatic Equipment

AD-768 772/6GA PC$3.50/MF$1.45
Army Missile Command Redstone Arsenal Ala Aeroballistics Directorate
STATIC TEST PERFORMANCE CHARACTERISTICS OF SEVERAL FLUIDIC CONTROL VALVE CONFIGURATIONS.
Technical rept.,
Troy A. Street, Thomas L. Killough, and Robert E. Becht. 14 Sep 73, 69p Rept no. RD-TR-73-29

Descriptors: (*Fluid amplifiers, Performance(Engineering)), (*Guidance, Control systems), (*Antitank ammunition, *Guided missiles(Surface-to-surface)), Fluidics, Guided missile components, Captive tests, Valves, Attitude control systems, Instrumentation.
Identifiers: *Fluerics.

A static test has been conducted for seven fluidic valve configurations. The plenum pressure was varied from 500 to 1500 psia, which represented design (1200 psia) and off-design pressures. The measurements were forces, moments, internal static pressures, and valve exit total pressures. The data are graphically presented and discussed. (Author)

K-Trans-68/GA PC$8.25/MF$1.45
THEORETICAL AND EXPERIMENTAL STUDIES ON THE OPERATING CHARACTERISTICS OF A THREE-STAGE AXIAL COMPRESSOR WITH HIGH PER-STAGE PERFORMANCE.
L. Turanskyj. 1971, 125p
Translated from German.

Descriptors: (*Compressors, *Performance testing), Gas flow, Operation, Planning, Three-dimensional calculations.

For abstract, see NSA 28 07, number 17770.

N73-31257/1GA PC$6.25/MF$1.45
Siemens A.G., Munich (West Germany). Forschungslab.
MINIATURIZATION IN FLUIDICS.
A. Rechten. Apr 73, 81p BMFT-FB-T-73-06
Subm-Sponsored by Bundesmin. Fuer Forsch. Und Technol.
In German; English Summary.

Descriptors: *Fluid switching elements, *Fluidics, *Miniaturization, Fluidic circuits, Integrated circuits, Logic circuits, Miniature electronic equipment, Time.

For abstract, see STAR 1122

N73-30428/9GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AUTOMATICALLY OPERABLE SELF-LEVELING LOAD TABLE.
Patent Application.
J. L. Burch. Filed 8 Aug 73, 21p NASA-CASE-MFS-22039-1, PAT-APPLN-386790
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Automatic control, *Leveling, *Solenoid valves, Flat surfaces, Patent applications.

For abstract, see STAR 1121

PATENT-3 489 318/GA Not available NTIS
Department of the Navy Washington D C
BUOYANCY SYSTEM.
Patent,
Jay Witcher, and Herman S. Kunz. Filed 11 Dec 67, patented 13 Jan 70, 4p Rept nos. PAT-APPL-689 572,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Inflatable structures, *Patents), (*Underwater objects, Recovery), Buoyancy, Containers, Hydrazine, Gas generating systems.
Identifiers: PAT-CL-222-95.

The invention relates to a gas inflatable floatation bag to be used in underwater recovery.

SLL-73-7/GA PC$4.00/MF$1.45
Sandia Labs., Livermore, Calif.
DEVELOPMENT OF POROUS STAINLESS-STEEL FLOW CONTROL DEVICES.
P. B. Lindsay. Jun 73, 47p
Contract AT(29-1)-789

Descriptors: (*Leaks, *Fabrication), (*Flow regulators, Fabrication), (*Stainless steels, Fabrication), Flow rate, Powder metallurgy, Powders, Pressing.

For abstract, see NSA 28 07, number 17812.

13H. Industrial Processes

AD-768 475/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PECULIARITIES OF KINEMATICS OF THE ROLLING PROCESS IN FINISHING CHANNEL PASSES,
Yu. N. Alekseev, N. F. Gritsuk, and E. D. Gavrilenko. 11 Oct 73, 13p Rept no. FTD-HT-23-189-74
Edited trans. of Samoletostroenie i Tekhnika Vozdushnogo Flota (USSR) n25 p114-120 1971, by James R. Moore.

Descriptors: (*Rolling(Metallurgy), Kinematics), Steel, Deformation, Structural parts, USSR.
Identifiers: Translations.

A study was made of the process of rolling channel steel to determine the character of longitudinal displacement of metal along the perimeter of the strip.

AD-768 692/6GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
DETERMINATION OF MAXIMUM PRODUCTIVITY OF SUBLIMATION DRYING INSTALLATION,
B. P. Kamovnikov. 7 Aug 73, 7p Rept no. FSTC-HT-23-1094-72
Trans. of Konservnaya i Ovoshchesushilnaya Promyshlennost (USSR) n1 p15-16 1971.

Descriptors: (*Drying, Efficiency), Material control, Sublimation, USSR.
Identifiers: Translations, *Drying apparatus, Productivity, Performance evaluation.

The maximum productivity of various sublimation dryers is determined on the basis of the amount of material processed in a certain time, as opposed to the duration of the drying process itself. Equations for calculating these amounts are presented in the Russian translation.

AD-768 746/0GA PC$3.00/MF$1.45
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
ESTABLISHMENT OF TIGHTENING TORQUE VALUES FOR MS FLARELESS FLUID CONNECTORS.
Phase rept.,
Adolf Bold. 20 Sep 73, 12p Rept no. NADC-73203-30

Descriptors: (*Joining, Torque), (*Pipes, Metal joints), Material forming, Specifications, Cold working, Stainless steel, Aluminum alloys, Assembling, Specifications.
Identifiers: Tubes, Flareless connections.

Repeated assembly tests confirmed validity of existing torque values in MS33566 for use on CRES tubing and established new torque values for use on aluminum alloy tubing of various wall thicknesses. (Author)

AD-768 916/9GA PC$3.75/MF$1.45
University of Southern California Marina Del Rey Information Sciences Inst
A PRELIMINARY ANALYSIS OF THE ECONOMIC IMPACTS OF PROGRAMMABLE AUTOMATION UPON DISCRETE MANUFACTURING INDUSTRIES,
Nake M. Kamrany. Oct 73, 79p* Rept no. ISI/RR-73-4
Contract DAHC15-72-C-0308, ARPA Order-2223/1

Descriptors: (*Industries, Economics), (*Manufacturing methods, Automation), Production, Costs, Employment, Commerce, Stability.
Identifiers: Programmable automation.

The potential savings of computer-based manufacturing systems are hypothesized. It is a conjectured contention that the development of computer-based automation will yield better benefits than those produced by usual technological progress. However, the approach examines cost savings rather than contribution to growth. The savings impact upon DOD procurement and the production costs of the discrete manufacturing sector is hypothesized by assuming the existence of an automated factory, although such a reality is perhaps several decades away. Many assumptions are made about costs, its components and relationships. A case study, literature references, opinions of consultants, and other case studies and judgmental costs provide the basis for the hypothesis. Also, the societal impacts of computer-based manufacturing automation are conjectured upon the environment, employment, general price level, urban/rural mix, and international trade. A number of definitions and distinctions are made with respect to automation, productivity, technology, and related points. (Author)

AD-769 028/2GA Not available NTIS
Defence Standards Labs Maribyrnong (Australia)

QUALITY CONTROL AND NON-DESTRUCTIVE TESTING OF CASTINGS,
W. L. J. Crofts. 1973, 8p
Availability: Pub. in Testing, Instruments and Controls, v10 n6 p1-8 Jun 73.

Descriptors: (*Castings, *Quality control), (*Non-destructive testing, Castings), Radiography, Visual inspection, Penetration, Hydrostatic tests, Ultrasonic radiation, Magnetic fields, Defects(Materials), Australia.
Identifiers: Magnetic particle tests, Fluorescent penetration tests.

The intention of the report is to emphasise the need for wider application of non-destructive testing procedures in the assessment of the quality of castings, and to discuss the more important procedures available for the purpose.

BDX-613-948/GA PC$3.50/MF$1.45
Bendix Corp., Kansas City, Mo.
EXTRUDE HONE DEBURRING.
L. K. Gillespie, and L. H. Jr. Luebbert. Aug 73, 29p
Contract AT(29-1)-613

Descriptors: (*Machine parts, Honing), (*Honing, *Reliability), (*Control equipment, Reliability), Equipment protection devices, Measuring instruments, Miniaturization, Switches.

For abstract, see NSA 28 08, number 20603.

JPRS-60162/GA PC$21.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
CONTROL SYSTEMS,
V. N. Zakharov, D. A. Pospelov, and V. E. Khazatskii. 28 Sep 73, 378p
Trans. of mono. Sistemy Upravleniya, Moscow, 1972 344p.

Descriptors: (*Industrial plants, *Process control), Control theory, Mathematical models, Digital computers, Logic circuits, Data processing, Mathematical logic, Automata theory, Translations, Automation, USSR.

The report contains a textbook exposition for engineers for planning control systems for industrial automation. The problems of establishing mutual understanding between the purchaser and the developer, methods of constructing a formalized technical assignment, and evaluations most important to the purchaser are discussed.

LBL-1495/GA PC$3.75/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
THERMODYNAMICS OF SOLID STATE SINTERING.
C. E. Hoge, and J. A. Pask. Mar 73, 32p CONF-730905-1
Contract W-7405-eng-48

Descriptors: (*Solids, Sintering), (*Sintering, *Thermodynamics), Free energy, Grain boundaries, Particle size, Thermodynamic properties.

For abstract, see NSA 28 07, number 17779.

MLM-2050/GA PC$4.00/MF$1.45
Mound Lab., Miamisburg, Ohio.
FABRICATION OF SMALL METAL SPHERES.
L. J. Wittenberg, and D. L. Fleming. 31 May 73, 5p
Contract AT(33-1)-Gen-53

Descriptors: (*Metals, *Spheres), (*Lead, Spheres), Fabrication, Liquid metals, Particle size, Shear.

For abstract, see NSA 28 07, number 17783.

N73-31037/7GA PC$3.00/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
CONCENTRATION DETERMINATION OF IMPREGNATION SALT SOLUTIONS FOR TELECOMMUNICATION MASTS USING RADIATION PHYSICS METHODS BESTIMMUNG DER KONZENTRATION VON TRAENKSALZLOESUNGEN FUER FERNMELDEMASTEN NACH METHODEN DER STRAHLUNGSPHYSIK.
G. Lemm. Nov 71, 14p FTZ-A-518-TBR-1
Language in German.

Descriptors: *Impregnating, *Wooden structures, *X ray fluorescence, Arsenic, Boron, Chromium, Concentration (Composition), Copper, Fluorine, Poles (Supports).

For abstract, see STAR 1122

PAT-APPL-350300/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
APPARATUS AND METHOD OF MOLDING.
Patent Application.
W. C. Heier. Filed 11 Apr 73, 16p NASA-CASE-LAR-10489-2,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Forming techniques, *Molds, *Plastics, Compressing, Mechanical devices, Patent applications, Thermosetting resins.

An appraratus and method for compression molding of thermosetting plastic compositions is reported wherein heat is applied to the compressed load in a mold cavity and adjusted to hold molding temperature at the interface of the cavity surface and the compressed compound to produce a thermal front. This thermal front advances into the evacuated compound at mean right angles to the compression load and toward a thermal fence formed at the opposite surface of the compressed compound.

PAT-APPL-379049/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EVACUATED DISPLACEMENT COMPRESSION MOLDING.
Patent Application.
W. C. Heier. Filed 13 Jul 73, 19p NASA-CASE-LAR-10782-2,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Evacuating (Vacuum), *Molds, *Pressure effects, *Thermosetting resins, Forming techniques, Molding materials, Patent applications, Plastics, Tubes.

A process of molding long thin walled tubular bodies from thermosetting plastic molding compounds is reported wherein the tubular body lengths may be several times the diameters. The process is accomplished by loading a predetermined quantity of molding compound into a female mold cavity closed at one end by a force mandrel. After closing the other end of the female mold with a balance mandrel, the loaded cavity is evacuated by applying a vacuum. The mold temperature is raised to the minimum temperature at which the resin constituent of the compound will soften or plasticize. A mold insert may be attached to the female mold to permit molding of exterior spiral threads on one end of the molded article.

PATENT-3 527 919/GA Not available NTIS
Department of the Navy Washington D C
EXTENDED ELECTRODE WELDING TECHNIQUE.
Patent,
Irving L. Stern, and Vincent D. Schaper. Filed 5 Feb 69, patented 8 Sep 70, 5p Rept nos. PAT-APPL-796 666,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Arc welding, *Patents), Metal plates, Steel.
Identifiers: Gas metal arc welding, Butt welds, PAT-CL-219-137.

The patent relates to arc welding of relatively thick close square butt steel joints wherein the welding operation is confined to a narrow deep groove or gap and is carried out in a gaseous atmosphere.

PATENT-3 528 165/GA Not available NTIS
Department of the Navy Washington D C
CORROSION INHIBITING PROCESS.
Patent,
Forrest S. Williams, and Robert L. Abbott. Filed 24 Apr 67, patented 15 Sep 70, 3p Rept nos. PAT-APPL-634 057,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Corrosion inhibition, *Patents), Mechanical fasteners, Metal seals, Hermetic seals, Ultrasonic welding.
Identifiers: PAT-CL-29-470-1.

The patent relates to an improved process for inhibiting corrosion at and around fastening devices that are used to join two or more load carrying structural elements one to the other. The improved method involves the use of a metallic patch or strip ultrasonically welded over the exposed extremities of the fastening devices to provide a hermetic seal from the external environment.

PB-224 378/0GA PC$3.00/MF$1.45
Transport and Road Research Lab., Crowthorne (England).
INSTRUMENTATION FOR A FULLY AUTOMATIC ASPHALT MIXING PLANT,
R. Weeks. 1973, 38p* TRRL-LR-578

Descriptors: (*Asphalt plants, *Automatic control equipment), Instruments, Indicating instruments, Detectors, Temperature measuring instruments, Thermocouples, Moisture meters, Aggregates, Process control, Great Britain.
Identifiers: On line computers.

The operation of a pilot-scale asphalt plant is being put under the complete control of a small on-line computer with the aim if improving the accuracy and uniformity of both the composition and temperature of the materials produced by the plant. The computer control unit requires accurate information about the plant and the process; equipment for weighing, for moisture and temperature measurement and for sensing contents, level, motion and position has been installed on the plant for this purpose. The Report discusses the factors that influenced the selection of the various instruments and outlines the progress made to date in the evaluation of those installed on the plant. (Author)

PB-224 509/0GA PC$2.75/MF$1.45
Bureau of Mines, Washington, D.C.
NUCLEAR GAGES FOR MONITORING THE COALBED OF COMMERCIAL-SCALE PRESSURIZED GAS PRODUCERS.
Rept. of investigation,
G. R. Friggens, and A. W. Hall. Sep 73, 14p
BuMines-RI-7793
Prepared by Morgantown Energy Research Center, West Virginia.

Descriptors: (*Beds(Process engineering), *Monitors), (*Radiation measuring instruments, Monitors), Coal gasification, Gas generators, Gamma rays, Coal gas.

A nuclear method for continuously monitoring the coalbed and ash levels and void formation in commercial-scale, fixed-bed, pressurized gas produ-

cers is proposed. Measurement of gamma ray transmission through the coalbed is the basis of the method. The coalbed level is monitored by detecting the transmission of gamma rays from a 1 to 2 Ci Co-60 source positioned on the outside wall of the vessel. Coal bridging or, alternatively, ash level is monitored by a 10 Ci Co-60 source at the center of the coalbed. Source activities and geometries are calculated for a 12-foot-ID producer designed to operate at 350 psi. Source capsule and detector specifications and operational safety are also stressed. (Author)

SLA-73-619/GA PC$4.75/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
SPUTTER DEPOSITION AND ION PLATING TECHNOLOGY.
D. M. Mattox. Jun 73, 51p

Descriptors: Bibliographies, Deposition, Ion beams, Plating, Reviews, Sputtering, Substrates.

For abstract, see NSA 28 08, number 18731.

Y-IA-119/GA PC$3.50/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
PREVENTIVE MAINTENANCE SYSTEMS AT THE Y-12 PLANT.
J. K. Bryson, and D. H. Gentry. 2 May 73, 27p
CONF-730620-1
Contract W-7405-eng-26

Descriptors: (*Y-12 plant, *Maintenance), Management.

For abstract, see NSA 28 07, number 17831.

Y-SC-75/GA PC$9.25/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
MACHINING AND GAGING INFORMATION 1972 ANNUAL INDEX.
A. M. Read, and D. S. Beaver. 20 Jul 73, 143p
Contract W-7405-eng-26

Descriptors: (*Machining, *Bibliographies), (*Displacement gages, Bibliographies), Indexes.

For abstract, see NSA 28 07, number 15429.

Y-1885/GA PC$4.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
CONTACT TOOL SETTER.
L. M. Greene. 9 Jul 73, 16p
Contract W-7405-eng-26

Descriptors: (*Machine tools, *Control equipment), Operation.

For abstract, see NSA 28 07, number 17830.

ZJE-122/GA PC$3.75/MF$1.45
Skoda Works, Pilsen (Czechoslovakia). Nuclear Power Construction Dept.
WELDING OF THICK-WALLED PRESSURE VESSELS OF NUCLEAR AND CHEMICAL REACTORS.
J. Becka, J. Konigsmark, P. Kricka, and V. Vlcek. 1972, 34p
U.S. Sales Only.

Descriptors: (*Chromium-molybdenum steels, *Welding), (*Carbon steels, Welding), (*Pressure vessels, *Fabrication), (*Containers, Fabrication), Chemical reactions, Fabrication, Manganese additions, Molybdenum additions, Nickel additions, Reactors, Size, Thickness, Weight.

For abstract, see NSA 28 07, number 15986.

13I. Machinery and Tools

AD-768 454/1GA PC$7.00/MF$1.45
Airesearch Mfg Co of Arizona Phoenix
COMPLAINT FOIL GAS LUBRICATED BEARING.
Final rept. Apr 72-May 73,
D. E. Heuer, and R. A. Collins. Jun 73, 97p Rept no. 73-310169 AFAPL-TR-73-56
Contract F33615-72-C-1802

Descriptors: (*Gas bearings, Gas turbines), Acceptability, Thrust bearings, Journal bearings, Lubrication, Foils.

A series of demonstration tests, similar to those required for engine qualification, were conducted on a gas turbine engine using gas lubricated complaint foil bearings. The engine operated successfully throughout the water ingestion and dust ingestion tests. When subjected to high-yaw manuever rates, which subjected the bearings to high gyroscopic moment loads, the ultimate load capacity of the bearings was reached. When subjected to high vibration, structural resonance was incurred which amplified the input vibration at the bearing carrier. The forward journal bearing did not survive the test but its vibrational loading was 5 times what was originally intended. Results of the overtemperature test indicated that the present bearing coating is acceptable up to 550F, but higher temperature coatings would be required if the bearings should be installed in new, advanced-design engines. (Modified author abstract)

AD-768 768/4GA PC$3.00/MF$1.45
Army Weapons Command Rock Island Ill General Thomas J Rodman Lab
EVALUATION OF TORSIONAL PROPERTIES OF SPRING MATERIALS.
Technical rept.,
Henry P. Swieskowski. May 73, 48p Rept no. AMSWE-R-RR-T-3-32-73

Descriptors: (*Springs, Torsion), Wire, Steel, Stainless steel, Stresses, Cold working, Elasticity, Strain hardening.
Identifiers: Torsional strength.

Torsional properties of various spring materials were evaluated. All materials tested were of solid circular cross section with a diameter of approximately .200 inch. Test specimens were twisted on a torsion tester equipped with an automatic recorder by which torque-angular strain diagrams were plotted. Diagrams were analyzed and measurements made to determine values for proportional and elastic limits. The amount of increase to the proportional and elastic limits that results from strain hardening was determined. The effects of shot peening on the elastic limit were also studied. Strain hardening of the high carbon steels had little effect on the proportional limit, but did produce a substantial increase in the elastic limit. The shot peening operation had little noticeable effect on the torsional properties. Detailed tables of torsional properties are presented and results discussed. (Author)

AD-769 064/7GA PC$5.15/MF$1.45
Boeing Vertol Co Philadelphia Pa
DESIGN, FABRICATION, TEST, AND EVALUATION OF SPIRAL BEVEL SUPPORT BEARINGS (TAPERED ROLLER).
Final rept. 4 Mar 71-4 Dec 72,
A. J. Lemanski, J. W. Lenski, Jr., and R. J. Drago. Jun 73, 187p USAAMRDL-TR-73-16
Contract DAAJ02-71-C-0025

Descriptors: (*Roller bearings, Transmission gears), Helicopters, Taper, Acceptability, Mathematical analysis.
Identifiers: Fatigue life.

The report presents the results of an analytical and experimental program to evaluate the influence of critical bearing parameters on the performance of high-speed (20,000 fpm - 1.42 million DN), high-load (5500-lb thrust, 7500-lb radial) tapered-roller, spiral bevel gear support bearings for use in helicopter transmissions. The program consisted of a generalized analytical investigation and then an experimental investigation based on the information obtained in the analytical investigation. In the generalized analytical investigation, a method of analysis was developed which covered bearing kinematics, internal load distribution, oil film thickness, contact stress, and fatigue life. The experimental investigation was conducted on 53 tapered roller bearings of the 6500 series (3.50-in. bore) by performing rotating load testing. Also, preliminary screening tests were conducted on 13 additional bearings to establish key bearing design modifications. (Author)

BDX-613-708(Rev.)/GA PC$3.00/MF$1.45
Bendix Corp., Kansas City, Mo.
OPTIMIZING MINIATURE CYLINDRICAL PIECEPART MACHINING CAPABILITIES.
J. M. Robb. Aug 73, 20p
Contract AT(29-1)-613

Descriptors: (*Machine parts, *Fasteners), Machine tools.

For abstract, see NSA 28 07, number 17713.

N73-31440/3GA PC$18.00/MF$1.45
Rocketdyne, Canoga Park, Calif.
FLEXIBLE ROTOR DYNAMICS ANALYSIS.
Final Report, Feb. 1971 - May 1973.
F. A. Shen. Sep 73, 318p NASA-CR-121276, R-9252
Contract NAS3-14422

Descriptors: *Computer programs, *Dynamic characteristics, *Rotor blades (Turbomachinery), *Rotor speed, Antifriction bearings, Flexibility, Stress analysis, Structural analysis.

For abstract, see STAR 1122

PAT-APPL-387094/GA PC$3.00/MF$1.45
Boeing Co., Huntsville, Ala.
A GUIDE FOR A TYPEWRITER.
Patent Application.
R. D. Dubois, and G. Pinson. Filed 9 Aug 73, 11p
NASA-CASE-MFS-15218-1,
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Alignment, *Error correcting devices, *Typewriters, Equipment specifications, Patent applications.

An improved guide, for use in aligning within a typewriter a sheet of paper preparatory to an application of typed indicia to a space is given. The guide is characterized by a bellcrank lever, pivotally supported by a swatch of flexible material adhesively secured to a typewriter adjacent the V-guides, and supporting at its distal end a space sight. The device also includes a pair of orthogonally related legs positionable into and out of the path of a type slug for framing a targeted space to be struck by a slug in response to a depression of a selected key.

PAT-APPL-387095/GA PC$3.25/MF$1.45
Sperry Rand Corp., Huntsville, Ala. Space Support Div.
AN IMPROVED SYSTEM FOR ENHANCING TOOL EXCHANGE CAPABILITIES OF A PORTABLE WRENCH.
Patent Application.
R. E. Marlow. Filed 9 Aug 73, 25p NASA-CASE-MFS-22283-1,
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Portable equipment, *Sleeves, *Wrenches, Patent applications, Pressure distribution, Tools.

The system is characterized by a sleeve telescopically received by the housing of a wrench motor and a pressure-responsive catch supported by the sleeve for alternately grasping and releasing tools. It is coaxially aligned with the wrench and seated within a tool receptacle.

PAT-APPL-395687/GA PC$3.00/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SHOCK ABSORBING MOUNT FOR ELECTRICAL COMPONENTS.
Patent Application.
R. F. Dillon, Jr., and R. C. Mayne. Filed 10 Sep 73, 14p NASA-CASE-NPO-13253-1,
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Circuit boards, *Shock absorbers, *Supports, *Viscoelasticity, Elastic media, Electrical insulation, Patent applications, Vibration damping.

A shock absorbing mount is described for individually isolating the components of an electrical circuit board from effects of shock. The mount includes a base mounted on a circuit board coupled with a receiver through a body formed of viscoelastic material that serves to isolate the receiver from the effects of shock to which the base is subjected.

PATENT-3 496 609/GA Not available NTIS
Department of the Navy Washington D C
UNIVERSAL VULCANIZING MOLD.
Patent,
Charles F. Ferguson. Filed 3 Oct 67, patented 24 Feb 70, 5p Rept nos. PAT-APPL-672 646,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Molding, *Patents), Containers, Vulcanization, Electric insulation, Electric cables, Flanges.
Identifiers: *Molds, PAT-CL-18-36.

The patent describes an injection mold for vulcanizing the insulation of an electrical cable to a tapered, metal flange mount. The mold has a removable central core assembly comprising a plurality of centrally excised wafers and a pair of centrally groved blocks. The wafers are selected from a set of wafers whose central excisions are graduated in size and the blocks are similarly selected from a set of blocks, whose central grooves are graduated in size. The cable fits into the grooves in the block and the tapered portion of the flange mount fits into the excisions in the wafers. By selecting blocks with suitably sized grooves and wafers with suitably size excisions, differently sized cables and flange mounts can be vulcanized to each other without having to machine a different mold for each individual job.

PATENT-3 515 449/GA Not available NTIS
Department of the Navy Washington D C
SOFT RUBBER SQUEEZE FILM BEARING.
Patent,
Alfred B. Harbage, Jr. Filed 10 Sep 68, patented 2 Jun 70, 3p Rept nos. PAT-APPL-758 868,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Bearings, *Patents), Propellers(Marine), Rubber, Water, Shafts.
Identifiers: PAT-CL-308-238.

The patent describes a soft rubber bearing particularly for propeller shafts and applications wherein the bearings will be lubricated by the environmental fluid and wherein the bearing surface comprises pockets formed in the soft rubber which are completely filled with water when the pocket is non-bearing. When the bearing and thereby some of the filled pockets are rotated to a bearing position, the non-compressibility of the water supports the shaft and squeezes past the wall of the pocket to thereby lubricate the rubber lands or ends which would otherwise be in contact with the shaft.

PATENT-3 520 218/GA Not available NTIS
Department of the Navy Washington D C
TRANSISTOR CAP REMOVER.
Patent,
Richard A. Tolkmitt. Filed 10 Apr 68, patented 14 Jul 70, 2p Rept nos. PAT-APPL-720 135,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Cutting tools, *Patents), (*Transistors, Maintenance), Containers.
Identifiers: PAT-CL-82-92.

The patent describes a method and apparatus for serving the side wall of a transistor can to expose its contained electronic component, such as semiconductor chip, without producing cuttings from the can wall which could contaminate or otherwise injure the component.

PATENT-3 526 745/GA Not available NTIS
Department of the Navy Washington D C
WELDING MACHINE.
Patent,
Algimantas A. Dargis. Filed 12 Sep 66, patented 1 Sep 70, 5p Rept nos. PAT-APPL-578 891,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Machines, Welding), (*Patents, Machines), Power supplies, Switching circuits.
Identifiers: Resistance welding machines, PAT-CL-219-108.

The patent describes a resistance welding machine which includes a power source connected to a variable pulse control and a variable impedance device interconnecting the pulse control to a pair of electrodes in series relationship. The pulse control comprises a one-shot multivibrator with a variable resistance device for establishing a desired pulse width. The variable impedance device comprises a transistor switching board which includes parallel connected resistors with series connected transistor switches associated with each resistor. A mechanical switch selectively interconnects the pulse control with various ones of the transistor switches for establishing the desired impedance and thus controlling the amplitude of the welding pulse.

PATENT-3 749 205/GA Not available NTIS
Denver Univ., Colo.
METAL SHEARING ENERGY ABSORBER.
Patent.
R. J. Fay, and E. P. Wittrock. Patented 31 Jul 73, 4p NASA-CASE-HQN-10638-1,
Misc-Filed 28 Dec. 1971 Supersedes N72-20465 (10 - 11, p 1482). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Energy absorption, *Metal cutting, Metals, Patents, Shearing.

A metal shearing energy abaorber is described. The absorber is composed of a flat thin strip of metal which is pulled through a slot in a cutter member of a metal, harder than the metal of the strip. The slot's length, in the direction perpendicular to the pull direction, is less than the strip's width so that as the strip is pulled through the slot, its edges are sheared off, thereby absorbing some of the pulling energy. In one embodiment the cutter member is a flat plate of steel, while in another embodiment the cutter member is U-shaped with the slot at its base.

PATENT-3 751 123/GA Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LOW MASS ROLLING ELEMENT FOR BEARINGS.
Patent.
R. J. Parker. Patented 7 Aug 73, 4p NASA-CASE-LEW-11087-1,
Misc-Filed 24 Nov. 1971 Supersedes N72-20464 (10 - 11, p 1482).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Ball bearings, *Roller bearings, Fatigue (Materials), Flexing, Patents, Plating.

Low mass rolling elements for bearings having a high fatigue strength and high resistance to flexure fatigue are reported. The elements have a lightweight core with a hollow center or is made of a low density material. The core is plated to provide a hard surface. (Author)

TID-26365/GA PC$4.00/MF$1.45
Virginia Univ., Charlottesville. School of Engineering and Applied Science.
RLES CYLINDRICAL BEARING PROGRAMS.
R. L. Tomlin, and J. S. Rose. Sep 64, 40p EP-3912-523-64-U
Contract AT(40-1)-1779

Descriptors: (*Journal bearings, *Pressure measurement), (*Computer codes, Journal bearings), Computers, Cylindrical configuration, Distribution, Programming.

For abstract, see NSA 28 08, number 20590.

13J. Marine Engineering

AD-768 365/9GA PC$3.50/MF$1.45
Battelle Columbus Labs Ohio
DIVER PLATFORM FOR OPERATION IN 2500 FEET OF SEAWATER.
Final rept. 16 Mar 72-15 Sep 73,
B. M. Bartilson, D. E. Adkins, J. A. Henkener, and D. C. Doerschuk. 27 Jul 73, 73p
Contract N00014-71-C-0317

Descriptors: (*Underwater vehicles, Design), Deep submergence, Mission profiles, Underwater communication systems, Diving, Power supplies, Breathing apparatus, Feasibility studies.
Identifiers: *Saturation diving.

A program was conducted to conceive a diver platform capable of supporting working divers to 2500 FSW. The program concentrated on the development of hardware, equipment, and mission requirements; the physiological limitations of man at this depth was not part of the work effort. Primary systems considered include diver platforms, a semi-submersible support craft with associated deck equipment, and the umbilical interface. Early in the program the scope was narrowed from a study of all types of diver platforms to consideration only of tethered platforms. Realistic mission requirements were defined that include two situations: short saturation dives (less than 24 hours) and longer saturation dives (1-14 days). By comparing different platform concepts, a preferred two-chamber configuration was recommended. The report describes detailed requirements for handling, gas, power, communication, instrumentation, umbilicals, and deck equipment. Of the equipment recommended for use at 2500 FSW, some is state of the art and the remainder requires research and development for use at that depth. (Modified author abstract)

AD-768 368/3GA PC$3.00/MF$1.45
Newark Coll of Engineering N J Dept of Mechanical Engineering
PRESSURE HULL OPTIMIZATION USING GENERAL INSTABILITY EQUATIONS AD-

MITTING MORE THAN ONE LONGITUDINAL BUCKLING HALF-WAVE,
Michael Pappas, and Arnold Allentuch. Jun 73, 42p Rept no. NCE-NV-9
Contract N00014-71-A-0124-0002

Descriptors: (*Pressure vessels, Buckling(Mechanics)), Optimization, Design, Stiffened cylinders, Hulls(Marine), Pressure, Mathematical models, Computer programs.
Identifiers: Computer aided design, Computerized simulation.

An improved method for predicting general instability admitting more than one longitudinal half-wave is adapted to an automated optimal design precedure described in NCE Reports NV5 and NV6. The original procedure assumes that the critical buckling shape contains only one longitudinal half-wave. This assumption is incorrect when ultra-high strength steels are used if what appears to be a questionable independent frame buckling constraint, used in the original design procedure, is relaxed. Design studies demonstrate that substantial weight benefits are possible at conventional operating depths (around 1,000 feet) if ultra-high strength steels are utilized and the new design equations are employed. Little weight improvement results from the use of high strength steels using the original design procedure. (Author)

AD-768 373/3GA PC$6.25/MF$1.45
Birdair Structures Inc Buffalo N Y
FEASIBILITY STUDY FOR AN INFLATABLE BOW RAMP.
Final rept. 11 Sep 72-21 Jun 73,
George F. Reitmeier, Milton B. Punnett, and John W. Phillips. 21 Jun 73, 267p NCEL-CR-74.002
Contract N62399-73-C-0003

Descriptors: (*Expandable structures, Feasibility studies), (*Ship structural components, Extendable structures), (*Amphibious operations, *Landing craft), Design, Configuration, Synthetic rubber, Pressurization, Loading(Mechanics), Mathematical models.
Identifiers: LST 1179 class vessels, Landing craft ramps.

The report describes a feasibility study for developing an inflatable bow ramp for the 1179 Class LST. The ramp must be 110 ft. long, 16 ft. wide, and carry the maximum loads imposed by an M103 tank. Ten possible conceptual configurations were investigated with a more detailed design analysis effort being concentrated on two of the concepts. The ramp will be constructed of a two ply neoprene fabric and inflated with an inflation system separate from ship air supply. A scale model of one concept was built and tested which verified design calculations. (Author)

AD-768 393/1GA PC$3.75/MF$1.45
Coast Guard Washington D C
STRANDING OF THE SS STEEL VENDOR ON LOAITA BANK IN THE SOUTH CHINA SEA ON 7 OCTOBER 1971 WITHOUT LOSS OF LIFE.
Marine accident rept.
20 Aug 73, 33p Rept no. USCG/NTSB-MAR-73-1

Descriptors: (*Merchant vessels, Accidents), (*Coast Guard, *Reports), Marine engines, Boilers, Boiler tubes, Failure(Mechanics), Performance(Human), Navigation, South China Sea, Marine safety equipment.
Identifiers: Steel Vendor vessel, Accident investigations, Marine accident reports, Loaita Bank.

On October 5, 1971, the fully loaded cargo ship SS STEEL VENDOR lost all propulsive power in the South China Sea, while en route from Manila, R.P.I., to Saigon, R.V.N. The ship drifted in heavy winds and seas and stranded on the Loaita Bank reef on October 7. Although the ship was a total loss, the entire crew was rescued. The report contains the action taken by the National Transportation Safety Board in determining the probable cause of the casualty and in making recommendations and the Marine Board of Investigation report and the action taken by the Commandant, U.S. Coast Guard. The National Transportation Safety Board determines that the probable cause of the loss of the SS STEEL VENDOR was the crew's inability to prevent the ship from being driven into a region of dangerous reefs. (Modified author abstract)

AD-768 516/7GA PC$3.50/MF$1.45
California Univ Berkeley Dept of Naval Architecture
A TIME DOMAIN SOLUTION TO THE MOTIONS OF A STEERED SHIP IN WAVES.
Interim rept.,
Leonardo Perez y Perez. Nov 72, 73p USCG-D-19-73
Contract DOT-CG-84549-A

Descriptors: (*Ships, Maneuverability), (*Ocean waves, Force(Mechanics)), Steering, Marine rudders, Pitch(Motion), Roll, Automatic pilots, Numerical methods and procedures.
Identifiers: Hydrodynamic force, Computer aided analysis, Sea states.

The problem of ship motions in waves is formulated in the time domain by means of a convolution integral which relates the ship motion response to arbitrary exciting forces, under assumption that the response is linear. The convolution integral is evaluated numerically to obtain the ship motions at discrete intervals of time. Frequency independent nonlinearities of arbitrary form are incorporated into the model by considering them as part of the arbitrary exciting forces. Nonlinearities with time lag, such as those arising from rudder motions, are particularly amenable to this treatment. Nonlinearities that are functions of the instantaneous motions of the ship are approximated by continuously extrapolating the ship motions. Thus one is able to include frequency-dependent linear force terms in what amounts to a stepwise solution of the nonlinear equation of motion, a capability not available in the conventional direct numerical integration techniques exemplified by, e.g., Runge-Kutta. (Author)

AD-768 697/5GA PC$3.75/MF$1.45
California Univ Berkeley Dept of Naval Architecture
CAPSIZING EXPERIMENTS IN SAN FRANCISCO BAY.
Annual rept. for 1973,
S. J. Chou, L. F. Magel, O. H. Oakley, J. R. Paulling, and P. D. Wood. Jun 73, 87p USCG-D-18-73
Contract DOT-CG-84549-A

Descriptors: (*Merchant vessels, Stability), Ship models, Ocean waves, San Francisco Bay, Instrumentation, Linear programming.
Identifiers: Capsizing, Container ships.

The report describes accomplishments for the period May 1, 1972 - June, 1973, under a research program entitled, 'Stability and Ship Motion in a Seaway'. The principal objective of this program is the study of extreme ship motion in waves, particularly in regard to survivability against capsizing. The research includes a program of experiments conducted with free-running radio controlled ship models in the open waters of San Francisco Bay, and a theoretical part involving studies of large amplitude motion and the extrapolation of current research results to real ship experience. (Modified author abstract)

AD-768 739/5GA PC$3.50/MF$1.45
Naval Ship Research and Development Center Bethesda Md
MOTIONS AND HULL-INDUCED BRIDGING-STRUCTURE LOADS FOR A SMALL WATERPLANE AREA, TWIN-HULL, ATTACK AIRCRAFT CARRIER IN WAVES,
Harry D. Jones, and David M. Gerzina. Aug 73, 74p Rept no. NSRDC-3819

Descriptors: (*Catamarans, Loading(Mechanics)), (*Aircraft carriers, *Ocean waves), Ship hulls, Force(Mechanics), Yaw, Bending, Pitch(Motion), Performance(Engineering), Ship models.

An experimental investigation was performed with a model in the maneuvering and seakeeping facility at the Naval Ship Research and Development Center to determine the characteristics of a proposed small waterplane area, twin-hulled, attack aircraft carrier in waves. Motions of the model were measured, together with the forces and moments induced by the hulls on the cross structure spanning the two hulls. Experimental data were compiled in head, bow, beam quartering, and following regular waves in addition to long-crested, irregular head and beam waves. Some powering measurements were also made in regular head waves. (Author)

AD-768 863/3GA PC$4.25/MF$1.45
Teledyne Materials Research Waltham Mass
COMPUTER PROGRAMS FOR THE DIGITIZING AND USING OF LIBRARY TAPES OF SHIP STRESS AND ENVIRONMENT DATA.
Final rept.,
Aldie E. Johnson , Jr., James A. Flaherty, and Isaac J. Walters. Feb 73, 115p* Rept no. E-1149(d) SSC-237
Contract N00024-69-C-5161

Descriptors: (*Cargo ships, Stresses), (*Stresses, *Computer programs), Analog-digital computers, Magnetic tape, Control sequences, Instruction manuals, Statistical analysis.
Identifiers: Stress analysis.

Processor programs are given to convert original analogue stress data and hand-entry ship, sea and weather environmental information to a final digital format. Included is a program to provide a capability to retrieve portions of the data for subsequent statistical analysis. (Author)

AD-768 910/2GA PC$6.75/MF$1.45
Nielsen Engineering and Research Inc Mountain View Calif
THEORETICAL ANALYSIS OF CYCLOIDAL PROPELLERS.
Final rept. 1 May 70-30 Jun 73,
Michael R. Mendenhall, and S. B. Spangler. 30 Jun 73, 95p Rept no. NEAR-TR-53
Contract N00014-70-C-0346

Descriptors: (*Cycloidal propellers, Performance(Engineering)), Propellers(Marine), Blade airfoils, Camber, Wake, Vortices, Cavitation, Mathematical models.
Identifiers: Computer aided analysis.

A theoretical analysis of a cycloidal propeller was developed which accounts for the detailed structure of the wakes shed from the blades and their influence on blade loading. The analysis was developed for the two-dimensional case (infinite blade aspect ratio) and programmed for a digital computer. Calculations made over a range of pitch and advance ratio values indicate the wake to have a major influence in reducing the blade loading at low advance ratios. High local blade loadings occur when a blade passes near a wake vortex, and blade stall must be accounted for in the method. Comparisons with model propeller data indicate that the theory predicts the proper trends and levels of thrust, side force, and torque over a wide range of advance ratio and pitch. (Author)

AD-768 911/0GA PC$5.00/MF$1.45
Nielsen Engineering and Research Inc Mountain View Calif

THEORETICAL ANALYSIS OF CYCLOIDAL PROPELLERS. PART II. PROGRAM MANUAL.
Final rept. 1 May 70-30 Jun 73,
Michael R. Mendenhall, and S. B. Spangler. 30 Jun 73, 58p Rept no. NEAR-TR-53-Pt-2
Contract N00014-70-C-0346
See also report dated 30 Jun 73, AD-768 910.

Descriptors: (*Cycloidal propellers, Performance(Engineering)), (*Computer programs, Instruction manuals), Propellers(Marine), Blade airfoils, Camber, Wake, Vortices, Cavitation, Mathematical models, Two-dimensional flow.
Identifiers: FORTRAN 4 programming language, FORTRAN, CDC-6600 computers.

A computer program has been developed to predict the behavior and performance of a cycloidal propeller assuming two-dimensional flow. Potential flow methods are used and the wake vorticity shed from each blade is approximated by a number of discrete vortices. The interference of the wake on the blades, the blades on the wake, and mutual interference between the blades are considered. The report is a user's manual for the computer program. This program manual contains a description of the use of the program, instructions for preparation of input, a description of the output, a program listing, and sample cases. The theory and comparisons with three-dimensional data are described in Part I of this report. (Author)

AD-769 066/2GA PC$3.00/MF$1.45
Hydrospace-Challenger Inc Rockville Md
ENGINEERING ANALYSIS OF PERFORMANCE FACTORS FOR SUBSURFACE MOORINGS IN A DEEP-SEA ENVIRONMENT.
Final rept.,
David B. Dillon. Aug 73, 43p* Rept no. HCI-TN-6549-001
Contract N00014-73-C-0386

Descriptors: (*Mooring, Deep water), Cables(Mechanical), Cable fairings, Cordage, Nylon, Wire, Ocean currents, Drag.

Analysis of various taut, subsurface, deep moorings in a high-shear current are summarized. Wire rope, nylon, and Fiber-B lines are compared, as well as the effects of distributed buoyancy and enclosing fairing. Fiber-B is potentially better than steel wire. Fairing has a stronger effect. Both Fiber-B and fairing pose practical problems. Vertical deflections of 5% of depth are obtainable. Deflections of 1% or less require extraordinary measures. (Author)

COM-73-11632/9GA PC$4.25/MF$1.45
Hawaii Univ., Honolulu. Dept. of Ocean Engineering.
HAWAII'S FLOATING CITY DEVELOPMENT PROGRAM. THEORETICAL INVESTIGATIONS AND OPTIMIZATION OF THE PLATFORM'S SEAKEEPING CHARACTERISTICS.
Technical rept.,
Ludwig H. Seidl, John P. Craven, and Joe A. Hanson. May 73, 107p* UNIHI-SEAGRANT-CR-73-01, TR-2 NOAA-73090511
Contract NOAA-2-35245

Descriptors: (*Urban planning, *Hawaii), (*Offshore structures, Urban planning), (*Municipalities, Floating bodies), Urban development, Marine engineering, Platforms, Hydrostatics, Ocean waves, Computerized simulation, Equations of motion.
Identifiers: *Floating cities, Floating platforms, FORTRAN, FORTRAN 4 programming language, Six degrees of freedom, Seakeeping.

The report of Hawaii's Floating City preliminary engineering work presents the methods and findings of the initial theoretical investigations of the floating platforms's seakeeping characteristics. It also provides recommendations for design refinements that will minimize platform motions and acceleration forces in the seaways expected to prevail at the proposed installation site. Since single column heave response is of high importance, this facet is explored in detail first. Then equations of motion in six degrees of freedom are developed for a three-column single module of the ten-module core-ring of the city and finally for the 30-column core-ring in its entirety. These equations have been expressed in FORTRAN IV and mathematical simulations for various configurations in regular and irregular seas run on an IBM 360/65 computer. (Author)

COM-73-11834/1GA PC$7.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Sea Grant Project Office.
STUDIES ON THE FUTURE OF ATLANTIC PORTS,
Ernst Frankel. 10 Jul 73, 348p MITSG-72-18 NOAA-73100503
Contract NOAA-2-35150, Grant NSF-GH-88
Index No. 72-318-Nte Report on A Review of the Status and Analysis of Characteristics.

Descriptors: (*Marine terminals, Atlantic seacoast), Seaports, Harbor facilities, Water transportation, Supply afloat, Cargo transportation, Capacity, Economic analysis.
Identifiers: Sea Grant program.

The study is an attempt to review the capacity of ports on the U.S. Atlantic Coast, the past, present and projected future demand imposed upon them and their resulting ability to meet their future requirements. The changing functions of ports are discussed as they affect port operations themselves as well as the port interface with various modes of transportation. The facilities in the subject ports are analyzed including their past and current use, and an attempt made to derive a measure of port capacity. To analyze the competitive effects among ports serving the same region or regional parts, multiport models were developed. The use and structure of multipurpose ports and multiport models is discussed, with particular reference to the analysis of the U.S. Atlantic seaboard. Future needs are estimated by projecting demand and forecasting type and form of commodity movements as well as trends in transportation technology. The report concludes with the requirements for change in the physical form and use of U.S. Atlantic Ports to meet such future demands. (Modified author abstract)

N73-30249/9GA PC$3.50/MF$1.45
Defence Research Information Centre, Orpington (England).
EXPERIMENTAL STUDIES OF THE HYDRODYNAMIC FORCES AND MOMENTS ACTING ON ONE BLADE OF A SHIP'S PROPELLER AT AN OBLIQUE ANGLE OF FLOW.
K. Meyne, and A. Nolte. Jun 73, 26p DRIC-TRANS-3205, BR30550
Tran-Transl. Into English from Schiff und Hafen (Uetersen, West Ger.), V. 21, No. 5 May 1969 p 359-366.

Descriptors: *Axial flow, *Propeller blades, *Thrust, *Torque, Cavitation flow, Flow velocity, Force distribution, Hydraulic test tunnels, Pitch (Inclination), Ships.

For abstract, see STAR 1121

PATENT-3 490 268/GA Not available NTIS
Department of the Navy Washington D C
NONDESTRUCTIVE TESTING OF HULL STIFFENERS.
Patent,
Walter Hand, Maurice Silvergleit, and Nathan Fried. Filed 22 Jan 68, patented 20 Jan 70, 3p Rept nos. PAT-APPL-699 725,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Non-destructive testing, *Patents), (*Reinforcing materials, *Bonding), (*Ship hulls, *Reinforced plastics), Glass textiles, Bonded joints, Pressurization, Leakage(Fluid).
Identifiers: PAT-CL-73-40.

The invention relates to the nondestructive testing of the bonding between glass reinforced plastic sections and more particularly pertains to the testing of secondary bonding of stiffeners to a glass reinforced ship hulls. The testing is accomplished in-place and can be repeated during the life of the ship when necessary.

PATENT-3 512 493/GA Not available NTIS
Department of the Navy Washington D C
ADJUSTABLE BUOYANCY LIFT DEVICE.
Patent,
Lawrence William Hallanger. Filed 23 Apr 68, patented 19 May 70, 5p Rept nos. PAT-APPL-723 492,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Pressure vessels, *Patents), (*Underwater equipment, Recovery), Salvage, Flotation, Buoyancy, Lift, Valves.
Identifiers: PAT-CL-114-53.

The invention is an adjustable buoyancy device for lifting objects in water. The lift device includes a hollow container which at its bottom end is communicable with the outside water environment. Provision is made to open the container to a gas pressure source so that water within the container can be displaced therefrom and means are provided to open the container to selected water pressures so that the amount of water therein and accordingly the buoyancy thereof can be varied for lifting purposes.

PATENT-3 523 514/GA Not available NTIS
Department of the Navy Washington D C
SALVAGE PONTOON.
Patent,
Kenneth R. Fishel. Filed 27 Nov 68, patented 11 Aug 70, 6p Rept nos. PAT-APPL-779 378,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Floats, *Patents), (*Underwater equipment, Salvage), Buoyancy, Ballast tanks, Filling.
Identifiers: PAT-CL-114-52.

The patent relates to a salvage pontoon which has a negative metacentric height during its lift phase so that if the payload becomes accidentally detached during the lift phase the pontoon will rotate and fill with water through its open bottom end for a safe ascent to the surface. The pontoon includes a lift tank which is open at its bottom and closed at its top. A negative buoyancy control tank and a positive buoyancy tank are mounted to the top portion of the lift tank. The pontoon has a negative metacentric height and positive buoyancy when the lift tank, positive buoyancy tank, and negative height and positive buoyancy when the lift tank, positive buoyancy tank, and negative buoyancy control tank are dewatered.

PATENT-3 532 176/GA Not available NTIS
Department of the Navy Washington D C
CONTOURED SIDEWALLS FOR CAPTURED AIR BUBBLE SURFACE EFFECT SHIPS.
Patent,
Robert M. Williams. Filed 29 May 68, patented 6 Oct 70, 8p Rept nos. PAT-APPL-733 052,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Ship structural components, *Patents), (*Ground effect machines, *Ships), Ship hulls, Design, Fluid flow, Friction, Drag.

Identifiers: PAT-CL-180-126, *Captured air bubble ships.

The patent relates to an arrangement for altering the wetted area of a sidewall captured air bubble surface effect ship to minimize frictional drag by contouring the sidewalls in such a manner as to provide only the required sidewall area necessary to prevent air leakage throughout the operating range of the craft.

PB-224 678/3GA PC$3.00/MF$1.45
Mitsubishi Heavy Industries Lts., Tokyo (Japan).
STUDY ON LATERAL MOTIONS OF A SHIP IN WAVES BY FORCED OSCILLATION TESTS,
Mitsubishi technical bulletin,
Hitoshi Fujii, and Takeshi Takahashi. Aug 73, 18p
MTB-87

Descriptors: (*Merchant ships, Lateral stability), Ship models, Oscillation, Damping, Yaw, Equations of motion, Ship hulls, Roll, Japan, Ocean waves.

The coefficients of equations of motion were determined by the forced oscillation technique, as a step of improvement of the calculation of lateral motion: namely, sway, yaw and roll, of a ship in waves. The effects of frequency, advance speed and bilge keels on ship motions were clarified experimentally. The experimental values were compared with the calculated ones by the strip method. For the main terms of sway, yaw and roll, except roll damping terms, the both show fairly good agreement. For the coupling terms of sway-yaw, yaw-roll and roll-sway, the both also show comparatively good agreement. It is pointed out that some proper method should be developed for the approximation of the effects of viscous damping, advance speed, bilge keels and frequency of motion to obtain better prediction of the roll damping term. (Author)

SLA-73-172/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
DYNAMIC ENVIRONMENT OF VEHICLES AND VESSELS ASSOCIATED WITH ASSAULT LANDINGS.
M. B. Gens. Jun 73, 329p

Descriptors: (*Ships, *Environments), (*Vehicles, Environments), Impact shock, Mechanical vibrations, Seas, Transport.

For abstract, see NSA 28 08, number 20641.

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

AD-768 421/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
MULTISTAGE VACUUM MOLECULAR PUMP,
V. S. Kondrashev, L. M. Deev-Anishimov, and V. P. Golubev. 28 Sep 73, 8p Rept no. FTD-HT-23-245-74
Edited trans. of Patent (USSR) 338 684 p1-3, 15 May 72, by Paul J. Reiff.

Descriptors: (*Vacuum pumps, Patents), Design, USSR.
Identifiers: Translations.

The patent describes a multistage vacuum molecular pump consisting of rotor and stator elements with spiral channels placed in the housing on their working surfaces. To increase the pumping rate and the compression stage, the pumps are made in sections and the profiles of each of the sections are identical while the adjoining sections of the channel are made with a width-depth ratio which decreases in the direction of the pumping in the last stage, the channels in the adjoining sections are made with the helix angle relative to the velocity vector plane of the rotor elements which decreases in the direction of pumping.

AD-768 422/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
MULTISTAGE TURBOMOLECULAR VACUUM PUMP,
V. I. Kuznetsov, L. B. Leonov, B. V. Ivanov, and I. D. Anokhin. 9 Oct 73, 6p Rept no. FTD-HT-23-246-74
Edited trans. of Patent (USSR) 335 443 p1-2, 11 Apr 72, by Paul J. Reiff.

Descriptors: (*Vacuum pumps, Patents), Design, USSR.
Identifiers: Translations.

The patent describes a multistage vacuum turbomolecular pump which consists of a housing containing rotor and stator disks having working elements (blades, radial slots) along their periphery. To increase the compression stage and reducing the reverse flow of evacuated gas, the disk are made with a channel section which decreases in the direction of pumping from the maximum possible size in the first stage to a minimum, which approaches zero in the last stage.

AD-768 435/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
QUESTION OF THE APPROXIMATE EVALUATION OF THE STATIC CHARACTERISTICS OF THE VALVE FOR A CONSTANCY IN PRESSURE GRADIENT,
V. V. Ilinskii, and V. P. Guskov. 21 Sep 73, 12p Rept no. FTD-HT-23-174-74
Edited trans. of Samoletostroenie i Tekhnika Vozdushnogo Flota (USSR) n25 p21-25 1971, by Charles T. Ostertag, Jr.

Descriptors: (*Hydraulic valves, Performance(Engineering)), (*Thrust vector control systems, Hydraulic valves), Hydraulic servomechanisms, Fluid flow, Pressure, Pressure regulators, USSR.
Identifiers: Translations.

The report makes a numerical analysis of flow rate characteristics of a hydraulic regulator valve.

AD-768 806/2GA PC$9.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE WELDING AND BRAZING OF THIN WALLED PIPES,
A. M. Kitaev, and A. I. Gubin. 18 Oct 73, 142p
Rept no. FTD-MT-24-719-73
Edited machine trans. of mono. Svarka i Paika Tonkostennykh Truboprovodov, n.p., 1972 p1-133, by Marilyn Olaechea.

Descriptors: (*Pipes, *Welding), (*Brazing, Pipes), Aluminum alloys, Steel, Welds, Metal joints, Titanium alloys, Cleaning, Corrosion inhibition, Mechanical properties, Copper, Brass, USSR.
Identifiers: Translations, Tubes.

Contents:
General information on pipes;
Methods and technology of pipe welding;
Methods and technology of pipe brazing;
Pipes of aluminum alloys with steel connecting parts;
Surface treatment of pipes;
Strength of welded and brazed pipe joints;
Increasing pipe strength.

AD-769 058/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A METHOD FOR SUPERHEATING THE VAPORS OF WORKING FLUID IN A STEAM-JET VACUUM PUMP,
V. I. Shilov. 18 Oct 73, 5p Rept no. FTD-HT-23-658-74
Edited trans. of Patent (USSR) 347 456 p1-2 1972, by John A. Miller.

Descriptors: (*Vacuum pumps, Patents), Jets, Heating, Gas discharges, Nozzle gas flow, USSR.
Identifiers: Translations.

The invention pertains to steam-jet equipment and deals with a method for superheating the working fluid (vapors) in a steam-jet vacuum pump when they are fed to the nozzles. The purpose of this invention is to increase the discharge rate of the steam jet from the nozzles and increase the pumping rate by more intense and uniform superheating of the vapor across the vapor flow directly in the nozzle.

EUR-5017/GA PC$3.75/MF$1.45
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
PREDICTION OF CRITICAL CONDITIONS FOR FAILURE IN ZR--2.5% NB PRESSURE TUBES BY THE C.O.D. CRITERION.
B. Henry. Jun 73, 31p
In French. U.S. Sales Only.

Descriptors: (*Pressure tubes, *Failures), (*Zirconium base alloys, Failures), (*Niobium alloys, Failures), Cracks, Hydrides, Materials testing, Ruptures.

For abstract, see NSA 28 07, number 16004.

N73-30673/0GA PC$9.00/MF$1.45
California Univ., Berkeley. Space Sciences Lab.
MECHANICS OF WHEEL-SOIL INTERACTION.
Final Report.
H. J. Houland. Apr 73, 140p NASA-CR-133860, SSL-SER-14-ISSUE-23
Contract NGR-05-003-406

Descriptors: *Soils, *Surface reactions, *Wheels, Loads (Forces), Moments of inertia, Problem solving, Shear stress.

For abstract, see STAR 1121

PAT-APPL-280029/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
BIMETALLIC FLUID DISPLACEMENT APPARATUS.
Patent Application.
T. N. Canning. Filed 11 Aug 72, 11p NASA-CASE-ARC-10441-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Displacement, *Metals, Gas flow, Heating, Liquid flow, Patent applications.

Stirring and heating of stored gases and liquids is accomplished by using the deformation of a bimetallic structure which deforms significantly when heated. The deformation is used to effect gradual or impulsive motion of a piston, vane, wire, or diaphram for displacement of the fluid. The heated bimetallic is also employed for heating the stored fluid.

PATENT-3 514 949/GA Not available NTIS
Department of the Navy Washington D C
TURBOPROP FUEL CONTROL FOR USE WITH CONTAMINATED OR VARIED FUELS.
Patent,
John J. Fredlake, Milton F. Keck, and Glennon V. Schwent. Filed 18 Jun 68, patented 2 Jun 70, 9p
Rept nos. PAT-APPL-737 958,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Fuel meters, *Patents), (*Turboprop engines, Fuel meters), Fuel contamination, Fuel consumption, Control systems, Flowmeters.
Identifiers: PAT-CL-60-39-28.

The patent concerns the following: an engine power control system for a turboprop engine equipped with a constant speed propeller governor is provided with means to manipulate fuel flow in response to the corrected torque and corrected speed of the engine. The computer section of the engine power control system uses engine oil as the working media. These features enable the use of contaminated fuel, or fuels of varying quality, without requiring filtration or compensating adjustments to the control system.

PATENT-3 749 123/GA Not available NTIS
Bendix Corp., Davenport, Iowa. Instruments and Life Support Div.
DUAL STAGE CHECK VALVE.
Patent.
D. E. Whitten. Patented 31 Jul 73, 4p NASA-CASE-MSC-13587-1,
Misc-Filed 10 Dec. 1971 Supersedes N72-21483 (10 - 12, p 1618). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Control valves, *Cryogenic equipment, *Environmental control, *Spacecraft environments, Degradation, Patents, Sealing.

A dual stage seat valve head arrangement is described which consists of a primary sealing point located between a fixed orifice seat and a valve poppet, and a secondary sealing point between an orifice poppet and a valve poppet. Upstream of the valve orifice is a flexible, convoluted metal diaphragm attached to the orifice poppet. Downstream of the valve orifice, a finger spring exerts a force against the valve poppet, tending to keep the valve in a closed position. The series arrangement of a double seat and poppet is able to tolerate small particle contamination while minimizing chatter by controlling throttling or metering across the secondary seat, thus preserving the primary sealing surface.

PB-224 601/5GA PC$3.00/MF$1.45
Bureau of Reclamation, Denver, Colo. Engineering and Research Center.
LABORATORY LOAD TESTS ON BURIED FLEXIBLE PIPE-PROGRESS REPORT NO. 6. STEEL AND FIBERGLASS REINFORCED RESIN PIPE IN SAND BACKFILL,
Amster K. Howard. Jun 73, 49p*
REC-ERC-73-9

Descriptors: (*Pipes(Tubes), Loads(Forces)), (*Soil pressure, Pipes(Tubes)), Steels, Plastics pipes, Water pipes, Tests, Deflection, Fiberglass reinforced plastics, Backfills, Lateral pressure, Strains, Soil mechanics.
Identifiers: Reinforced plastic mortars.

Two steel pipe, one reinforced plastic mortar, and one fiberglass reinforced plastic pipe, each about 18 inches (46 centimeters) in diameter and 71 inches long were load-tested in a laboratory soil container. All pipe were buried in a sand backfill. Increasing surcharge increments were applied to the soil surface over the pipe. Data were collected on pipe deflection and shape, soil pressure, soil movement around the pipe, and strain on the inner surface of the pipe. Conclusions are: (1)Pipe tested in samd backfill (relative densities from 78 to 89 percent) deflected similarly- less than 1 percent at 100 psi (7.0 kg/sq cm) surcharge-regardless of pipe stiffness or pipe material. (2) Compared to tests on similar pipe in a low-density lean clay backfill, the sand backfill reduced pipe deflections over 95 percent. (3) The modulus of soil reaction of the sand backfill ranged from 6,000 psi (420 kg/sq cm) to 30,000 psi (2,100 kg/sq cm) depending on the calculation method used. The Iowa Formula predicts the percent deflection based on a ratio of the external pipe load to a combination of pipe strength and soil strength. The tests show that: (1) when high strength bedding is used, pipe material or strength has little effect on pipe deflection; and (2) when the soil is a poor material or is poorly compacted, pipe material or strength significantly affects pipe deflection.

13L. Safety Engineering

COM-73-11549/5GA PC$3.00/MF$1.45
National Maritime Research Center--Galveston, Tex. Liquefied Natural Gas Program.
IDENTIFICATION OF CODES, STANDARDS AND SAFETY REGULATIONS FOR PORPOSED LNG DEVELOPMENT TESTING LABORATORIES AT NMRC-GALVESTON.
Technical rept. Oct 72-May 73,
William M. Laney. Aug 73, 37p* NMRC 273-37000-R2

Descriptors: (*Production, Liquefied natural gas), (*Liquefied natural gas, *Test facilities), (*Safety, Liquefied natural gas), Fire safety, Regulations, Insurance, Standards, Design, Production, Technical Societies, Trade associations, Research.

The report examines safety requlations, codes and standards relevant to the design, construction and operation of a liquefied natural gas (LNG) develgpment and testing laboratory proposed for the National Maritime Research Center-Galveston. The proposed laboratory will be used for research efforts in support of the Maritime Administration Program for the marine transportation of LNG. (Modified author abstract)

COM-73-50831/9GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
DEVELOPMENT OF A PROCEDURE FOR MEASURING THE NOISE OF PAPER CAPS.
Technical note (Final) Mar 71-Jun 72,
Marilyn A. Cadoff, Denzil E. Mathews, and Donald S. Blomquist. Oct 73, 26p NBS-TN-793
Sponsored in part by Consumer Product Safety Commission., Washington, D.C.
Paper copy available from GPO $0.50 as C13.46:793.

Descriptors: (*Acoustic measurement, Test equipment), (*Hazardous materials, Noise), (*Children, Hazardous materials), Safety, Standards, Test methods, Auditory perception, Design, Engineering drawings.
Identifiers: Cap guns, *Paper caps, *Consumer safety, *Consumer affairs.

In recent years, a great concern has been expressed for consumer pretection and safety, especially for children. As an outgrowth of this concern, acoustical testing of potentially hazardous noise-producting toys has been carried out at the National Bureau of Standards for the Bureau of Product Safety (FDA) under the authority of the Toy Safety Act of 1969. This paper discusses in detail the testing work carried out on commercial cap guns and caps, which culminated in the development of a standard firing apparatus for testing paper caps. Engineering drawings of the standard apparatus are given as well as a recommended procedure for using this apparatus to test paper caps. (Author)

N73-31918/8GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
RECORDING AND CATALOGING HAZARDS INFORMATION.
R. J. Stein. 14 Sep 73, 34p NASA-TM-X-64782

Descriptors: *Hazards, *Identifying, Accident investigation, Energy distribution, Integrated circuits.

For abstract, see STAR 1122

PATENT-3 496 906/GA Not available NTIS
Department of the Navy Washington D C
DAY/NIGHT BIDIRECTIONAL MARINE MARKER.
Patent,
Merrill D. Gerke. Filed 2 Feb 68, patented 24 Feb 70, 3p Rept nos. PAT-APPL-702 619,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington,D.C. 20231 $0.50.

Descriptors: (*Markers, *Patents), (*Marine safety equipment, Markers), Luminescence, Dyes, Visual signals, Floats.
Identifiers: PAT-CL-116-124.

The patent relates to a bidirectional day-night marine location marker means which floats includes two frangible cylinders each containing a plastic bag, one loaded with an oxyluminescent material and the other loaded with a dye material. Each cylinder is mounted in facing relation to each other on a wooden block and a firing mechanism is seated there-between which when activated causes rupture of the caps and subsequent expulsion of the material in the two plastic bags in opposite directions spreading their contents on the water. The remainder of the marker body sinks.

PATENT-3 750 131/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SILENT EMERGENCY ALARM SYSTEM FOR SCHOOLS AND THE LIKE.
Patent.
W. S. Read, and V. W. Roberts. Patented 31 Jul 73, 8p NASA-CASE-NPO-11307-1,
Misc-Filed 6 Aug. 1971 Supersedes N72-11258 (10 - 02, p 0182). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Emergencies, *Schools, *Warning systems, *Wireless communications, Patents, Subaudible frequencies, Transmitter receivers.

An emergency alert system is described. In a school each classroom (or other area) is instrumented with a hidden microphone and receiver tuned to a non-audible frequency. The receivers' outputs are connected to a central display unit in the school's administrative office. Each instructor is provided with a small concealable transmitter which, when hand activated by the instructor upon the occurrance of any emergency, generates a non-audible signal at the receiver's tuned frequency.

PB-224 247/7GA PC$8.25/MF$1.45
University of Southern California, Los Angeles. Inst. of Aerospace Safety and Management.
MULTIDISCIPLINARY ACCIDENT INVESTIGATIONS. PHASE II.
Final rept. Jul 72-Jul 73,
J. D. Baird, F. L. Sublett, G. A. Parkison, E. Austin, and J. M. Pang. Sep 73, 420p USC-73
DOT-HS-800 920
Contract DOT-HS-010-1-176
See also Phase I, PB-223 722.

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Injuries, Human factors engineering, Automobiles, Failure, Highways, Environments, Design standards, Traffic safety.

The report is a summarization of a comprehensive and systematic in-depth study of 80 Multidisciplinary Accident Investigations that occurred in the Southern California area. The research was team a team effort of mechanical engineers, physicians, a psychologist, an automotive engineer, a pathologist, a mathematician, technicians, an analyst, secretaries and graduate and undergraduate students. The research includes a study of procedures utilized in investigating and reporting all collision involved aspects of the transportation system - the vehicle, the environment and the human, during

each phase of the collision - pre-, at and post-crash. Findings, conclusions, and recommendations are presented, based on data from 80 cases.

PB-224 273/3GA PC$3.00/MF$1.45
National Highway Traffic Safety Administration, Washington, D.C. Office of Accident. Investigation and Data Analysis.
FAILURE INDICES - NEW IMPROVED MEASURES OF PERFORMANCE,
Ezio C. Cerrelli. Sep 73, 45p* DOT-HS-820 302

Descriptors: (*Motor vehicle accidents, Indexes(Ratios)), Human factors engineering, Performance evaluation, Collision research.

The study utilizes the basic principles of 'indirect exposure' to arrive at an improved procedure to estimate the level of performance of driver-vehicle classes. In the previous study, 'Driver Exposure, Indirect Approach to Obtain Relative Measures', a procedure was established for estimating the driving exposure of various driver classes, based on reported accident responsibility. The report follows the same procedure, but in reverse order. Given estimates of driving exposure for selected driver-vehicle classes, it obtains a measure of their accident responsibility, and therefore their driving performance.

PB-224 284/0GA PC$3.00/MF$1.45
Transportation Systems Center, Cambridge, Mass.
LABORATORY EVALUATION OF ALCOHOL SAFETY INTERLOCK SYSTEMS, VOLUME I. SUMMARY REPORT.
Final rept. Aug 71-Oct 72,
E. Donald Sussman, and Charles N. Abernethy, III. Sep 73, 34p* DOT-TSC-NHTSA-73-3 DOT-HS-800 925

Descriptors: (*Motor vehicle operators, *Ethyl alcohol), (*Physical fitness, *Psychomotor tests), (*Automobiles, Safety devices), (*Instruments, Evaluation), Tracking(Position), Performance tests, Blood analysis, Correlations, Visual signals, Reaction time, Responses, Prevention, Detection.
Identifiers: Compensatory tracking, *Alcohol safety interlock systems, *Intoxication indicators, Blood alcohol levels, Visual signals, Divided attention tasks, Reaction time.

The report contains the results of an experimental and analytical evaluation of instruments and techniques designed to prevent an intoxicated driver from operating his automobile. The prototype interlock systems tested were drawn from a class of instruments which detect intoxication by measuring changes in the subjects ability to perform a psychomotor task.

PB-224 474/7GA PC$4.50/MF$1.45
Bureau of Mines, Washington, D.C.
INJURY EXPERIENCE IN COAL MINING, 1970.
Information circular,
Forrest T. Moyer, and Mary B. McNair. Sep 73, 144p BuMines-IC-8613

Descriptors: (*Coal mining, *Injuries), (*Safety, *Coal mines), (*Accidents, Coal mines), Legislation, Mortality, Statistical data, Tables(Data), Industrial accidents, Questionnaires, Safety engineering, Disasters.

Totals of 260 fatal and 11,552 nonfatal disabling work injuries occurred at respective frequency rates of 1.00 and 44.40 per million man-hours of worktime in the coal mining industry of the U.S. during 1970. For all injuries, the severity rate was 8308 days lost or charged per million man-hours and the average severity was 183 days lost or charged per injury. The injury data are classified by causes of injury-producing accidents, degree of injury, occupation of the injured time of injury occurrence, part of body, nature of injury, general work location, States, and other analytical factors related to accident-prevention work. Correlative data on men working, man-hours, production and productivity rates are classified in a number of groupings. The raw data were collected by mail on mandatory questionnaires from operating establishments in accord with the U.S.A. Standard Method of Recording and Measuring Work Injury Experience, Z16.1-1967, and the Standard Industrial Classification, 1967.

PB-224 565/2GA PC$5.25/MF$1.45
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
TRI-LEVEL ACCIDENT INVESTIGATION STUDY. VOLUME I.
Final rept. 1 Jun 71-30 Jun 72,
P. Cooley, J. O'Day, and S. Schultz. Aug 73, 193p
HSRI 010111-1 DOT-HS-800 912
Contract DOT-HS-031-1-135

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Human factors engineering, Injuries, Automobiles, Highways, Design standards, Safety engineering.

Volume I of a Final Report describing the first year of a tri-level accident study. The program design and methodology, Level III accident data characteristics, accident data analysis and topical areas relating to highway safety are discusses. Significant study findings are presented with some recommendations to improve motor vehicle safety. Portions of this document are not fully legible.

PB-224 671/8GA PC$8.00/MF$1.45
Calspan Corp., Buffalo, N.Y.
TRI-LEVEL ACCIDENT INVESTIGATION SUMMARIES LEVEL 3A INJURY CAUSATION, VOLUME 2, NUMBER 5.
Summary rept.
Aug 73, 376p DOT-HS-601 459
Contract DOT-HS-053-2-277
See also report dated Jul 73, PB-223 580.

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Human factor engineering, Automobile bodies, Design standards, Highways, Traffic safety, Safety engineering, Safety devices.

The report describes the Tri-level Accident Investigation concept. Basically, three levels of information are collected: Exposure and accident rate information; accident information on a large sample of accidents not normally collected by the police; and multidisciplinary in-depth information collected on a small sample of accidents by a team of professionals. The report specifically contains Level 3A accident summaries from the Tri-level Study. These summaries are brief descriptions of injury-producing accidents investigated by the Calspan Team to determine the specific injuries incurred and identify the specific interior components which caused such injuries. The volume contains summaries of 50 Injury Causation cases.

PB-224 680/9GA PC$7.25/MF$1.45
National Highway Traffic Safety Administration, Washington, D.C. Office of Accident Investigation and Data Analysis.
MULTIDISCIPLINARY ACCIDENT INVESTIGATION SUMMARIES. VOLUME 4, NUMBER 6.
Aug 73, 336 DOT-HS-601-447
See also Volume 4, Number 5, PB-223 976

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Human factors engineering, Death, Injuries, Highways, Automobiles, Design standards, Traffic safety.

The report contains case summaries of recent in-depth reports submitted by National Highway Safety Adiministration sponsored Multidisciplinary Accident Investigation Teams in a continuing series of publications. Accidents are involving vehicles of the last three model years of fatal, injury producing, or property damage severity. The teams investigate the accidents in-depth concerning themselves with each element of the collision (human, vehichle, environment) as it interacts with each phase of the collision (pre-crash, crash, post-crash). The summaries consist of identification information, basic information on the highway and vehicles invloved, a description of the drivers and occupants with their injuries, a phase-by-phase description of the sequence of events of the collision, and a list of the causal factors, conclusions and recommendations. A diagram of each collision is included.

PB-224 702/1GA PC$4.25/MF$1.45
Dunlap and Associates, Inc., Darien, Conn.
LABORATORY EVALUATION OF ALCOHOL SAFETY INTERLOCK SYSTEMS. VOLUME III. INSTRUMENT PERFORMANCE AT HIGH BAL.
Final rept. Aug 71-Oct 72,
John F. Oates, Jr., and Robert T. McCay. Sep 73, 124p* DOT-HS-800-927
Contract DOT-TSC-251-4
See also Volume 2, PB-224 703.

Descriptors: (*Instruments, Evaluation), (*Automobiles, Safety devices), (*Ethyl alcohol, *Motor vehicle operators), (*Physical fitness, *Psychomotor tests), Blood chemical analysis, Performance, Visual perception.
Identifiers: *Alcohol safety interlock systems, *Alcohol intoxication.

The report contains the results of an experimental and analytical evaluation of instruments and techniques designed to prevent an intoxicated driver from operating his automobile. The prototype 'Alcohol Safety Interlock Systems' tested were developed both by private industry and by the Transporation Systems Center and were all drawn from a class of instruments which detect intoxication by measuring changes in the subjects ability to perform a psychomotor task. The final report consists of the following documents: Volume I, Summary Report - Contains an overview and summary of all of the ASIS evaluation work performed through July 1972 and the results of the evaluation. Volume II, Instrument Screening Experiments - Contains details of the experiments conducted by the Guggenheim Center, Harvard School of Public Health, including experimental procedures, results and some preliminary data analyses. Volume III, - Instrument Performance at High BAL - Contains the results of the experimental work performed by Dunlap and Associates, Inc., covering the performance of subjects with relatively high blood alcohol levels on selected instruments.

PB-224 703/9GA PC$5.50/MF$1.45
Harvard School of Public Health, Boston, Mass. Guggenheim Center for Aerospace Health and Safety.
LABORATORY EVALUATION OF ALCOHOL SAFETY INTERLOCK SYSTEMS. VOLUME II. INSTRUMENT SCREENING EXPERIMENTS.
Final rept. Aug 71-Oct 72,
Ross A. McFarland, John D. Dougherty, Edward A. Arees, and Joyce J. Gird. Sep 73, 204p* DOT-HS-800-926
Contract DOT-TSC-213-1
See also Volume 1, PB-224 284 and Volume 3, PB-224 702.

Descriptors: (*Instruments, Evaluation), (*Automobiles, Safety devices), (*Ethyl alcohol, *Motor vehicle operators), (*Physical fitness, *Psychomotor tests), Blood chemical analysis, Performance, Visual perception.
Identifiers: *Alcohol safety interlock systems, *Alcohol intoxication.

The report contains the results of an experimental and analytical evaluation of instruments and techniques designed to prevent an intoxicated

driver from operating his automobile. The prototype 'Alcohol Safety Interlock Systems' tested were developed both by private industry and by the Transportation Systems Center and were all drawn from a class of instruments which detect intoxication by measuring changes in the subjects ability to perform a psychomotor task. The final report consists of the following documents: Volume I, Summary Report - Contains an overview and summary of all the ASIS evaluation work performed through July 1972 and the results of the evaluation. Volume II, Instrument Screening Experiments - Contains details of the experiments conducted by the Guggenheim Center, Harvard School of Public Health, including experimental procedures, results and some preliminary data analyses. Volume III, Instrument Performance at High BAL - Contains the results of the experimental work performed by Dunlap and Associates, Inc., covering the performance of subjects with relatively high blood alcohol levels on selected instruments.

PB-224 783/1GA PC$3.00/MF$1.45
Transport and Road Research Lab., Crowthorne (England).
MOTORWAY ACCIDENTS IN FOG AND DARKNESS,
H. D. Johnson. 1973, 16p TRRL-LR-573

Descriptors: (*Motor vehicle accidents, *Darkness), (*Fog, *Accident investigations), Collision research, Great Britain, Statistical data, Vehicular traffic, Traffic safety.

Analyses have been carried out to assess the accident problem in fog and in darkness on the main motorways in the country (M1, M2, M4, M5, M6) over the period 1969-1971; about 80% of all accidents in the motorway network have been covered and the various lengths have been broken down to make comparison between different locations. Accidents in fog totalled 192 in the three year period, making up 4% of the total: 129 of these occurred during daylight hours. Accidents were on average more serious, with more casualties per accident, than those occurring in other weather conditions. About 45% of fog accidents and 22% of non-fog accidents occurred on about one-seventh (160 km) of the motorway network. Accidents in darkness totalled 1801 (39% of all accidents) in the same period: 1563 of these occurred on unlit motorways. Consideration of accidents on different lengths of road related to traffic volumes showed a range from 0.3 dark accidents per km per year on the more lightly trafficked sections to 2.4 dark accidents per km per year on the more heavily trafficked. In comparison, the range of accidents per km during all hours was proportionately less, being 1.1 to 4.9. The larger differences in the numbers of dark accidents per km may be partly explained by the higher proportion of traffic flow at night on the more heavily trafficked sections of motorway. (Author)

UCID-16238/GA PC$5.75/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
SYSTEMS SAFETY ANALYSIS AND FAULT TREE ANALYSIS.
H. E. Lambert. 9 May 73, 74p
Contract W-7405-eng-48

Descriptors: (*Safety, *Hazards), (*Fault tree analysis, Safety), Safety engineering.

For abstract, see NSA 28 07, number 17819.

Y-JA-94/GA PC$3.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
EXTINGUISHMENT OF WOOL BAG FILTER FIRES USING HALON 1301.
J. R. DeMonbrun, and J. W. McCormick. 13 Jun 73, 11p
Contract W-7405-eng-26

Descriptors: (*Filters, *Fires), (*Resins, *Fire resistance), Combustion, Organic fluorine compounds, Wool.

For abstract, see NSA 28 07, number 17832.

Y-JA-96/GA PC$3.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
EXPERIMENTS WITH SPRINKLER HEAD CANOPIES FOR FIRE PROTECTION.
J. R. DeMonbrun, and J. W. McCormick. 2 Jul 73, 8p
Contract W-7405-eng-26

Descriptors: (*Fires, *Safety engineering), Pipes, Water.

For abstract, see NSA 28 08, number 20662.

13M. Structural Engineering

AD-768 437/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
NATURAL VIBRATIONS OF TWO CYLINDRICAL PANELS CONNECTED WITH AN ELASTIC FILLER,
B. A. Korbut, and G. V. Rubchenko. 11 Oct 73, 14p Rept no. FTD-HT-23-185-74
Edited trans. of Samoletostroenie i Tekhnika Vozdushnogo Flota (USSR) n25 p89-94 1971, by Louise E. Heenan.

Descriptors: (*Panels(Structural), *Vibration), Cylindrical bodies, Resonant frequency, Springs, Modulus of elasticity, Equations of motion, Stresses, USSR.
Identifiers: Translations.

Two thin-walled cylindrical panels connected with an elastic filler of arbitrary thickness are examined. Along the generatrices each of them is loaded with normal stresses. The natural vibrations of such a system are studied; symmetric and skew-symmetric strains and their interaction during vibrations are taken into account. The frequencies of natural vibration are determined with different densities and rigidities for the filler. The boundary conditions for the panels and the compressive stresses are varied.

AD-768 552/2GA Reprint
Technion - Israel Inst of Tech Haifa
BUCKLING ANALYSIS OF ELASTICALLY CONSTRAINED STIFFENED CONICAL SHELLS UNDER HYDROSTATIC PRESSURE BY COLLOCATION METHOD.
Interim rept.,
Avishai Shalev, Menahem Baruch, and Eliahu Nissim. 30 Nov 72, 16p AFOSR-TR-73-1918
Grant AF-AFOSR-2394-72
Availability: Pub. in the Jnl. of Israel Jnl. of Technology, v11 n1/2 p75-87 Mar 73.

Descriptors: (*Structural shells, Hydrostatic pressure), (*Buckling(Mechanics), Structural shells), Conical bodies, Underwater equipment, Loading(Mechanics), Numerical analysis, Israel.
Identifiers: Conical shells, Stiffened cones, Collocation(Mathematics), Computer aided analysis.

A brief review of the collocation method is presented, and an analysis by this method of an elastically constrained, stiffened conical shell subjected to hydrostatic pressure is carried out. The equations for the elastic boundary conditions of the ring and stringer-stiffened conical shells are obtained. Polynomials are then assumed as approximating functions, and are substituted to yield the approximating equations. A special matrix scheme is conceived to achieve more efficient computer processing. Numerical results are obtained for a set of twelve boundary conditions (SS1W to SS4W, SS12, SS13, SS24, SS34, SS1F to SS4F) applied to a particular shell configuration. The results are presented graphically and show a typical variation of the critical load due to the stiffening of a pre-selected boundary condition. Buckling shapes resulting from the different sets of the boundary condition are also presented. The various results obtained are discussed and some new physical conclusions are drawn. (Author)

AD-768 720/5GA PC$3.00/MF$1.45
Army Construction Engineering Research Lab Champaign Ill
METALLIC SHEAR WALLS FOR BMD GROUND SUPPORT SYSTEMS.
Interim rept.,
R. Quattrone, and R. Merritt. Aug 73, 32p Rept no. CERL-IR-M-32

Descriptors: (*Buildings, Walls), (*Walls, Metal plates), (*Antimissile defense systems, Launching sites), Steel, Shear stresses, Modulus of elasticity, Costs, Electromagnetic pulses, Electromagnetic shielding.
Identifiers: *Hardened installations, *Shear walls, Computer aided design.

The report considers the economic feasibility of using metallic interior shear wall elements in place of conventional reinforced concrete shear wall elements in hardened facilities. A simplified, aboveground two story building is designed using both conventional concrete and metallic shear wall elements. Five combinations of weapon yield and overpressure are used to size the building elements. Three wall configurations are considered: reinforced concrete, low yield strength steel (A-36), and high yield strength steel (A-514). Total facility and shear wall costs are compared. Based upon a somewhat limited use of metallic materials, it is nonetheless clearly indicated that the use of metallic interior shear walls can substantially reduce facility structural costs by as much as nine percent at low overpressures. Comparing the in-place wall costs, savings on the order of 50 percent are possible under some design requirements and metallic material properties. (Author)

AD-769 000/1GA PC$4.25/MF$1.45
Defense Documentation Center Alexandria Va
INFLATABLE, MODULAR AND OTHER PREFABRICATED STRUCTURES.
Report bibliography Mar 53-Jan 73.
Nov 73, 110p* Rept no. DDC-TAS-73-62

Descriptors: (*Inflatable structures, *Bibliographies), (*Modular space construction, Bibliographies), (*Prefabricated buildings, Bibliographies), Structures, Extendable structures, Expandable structures, Space stations, Shelters, Tents, Structural parts, Antennas, Textiles, Honeycomb cores, Sandwich construction, Polar regions, Mobile, Materials.
Identifiers: *Modular structures, Modular space structures, Prefabricated modular building units.

The bibliography is comprised of 69 citations of unclassified reports dealing with inflatable, modular and prefabricated structures. Some of the topics included are: Modular Space Construction, Prefabricated Buildings, Modular Space Structures, and Prefabricated Modular Building Units. The techniques and effectiveness of inflatable structures applied in the Army and immediate and future application of modular structures to manned space missions are covered. Corporate Author/Monitoring Agency, Subject, Title, Personal Author, Contract, and Report Number Indexes are included. (Author)

AD-769 075/3GA PC$3.50/MF$1.45
Weidlinger Associates New York
DYNAMIC RESPONSE OF CYLINDRICAL SHELLS IN BILINEAR MEDIA: AXISYMMETRIC CASE.
Final rept. Apr 72-Feb 73,
A. T. Matthews , and H. H. Bleich. 1 Mar 73, 69p DNA-3143F
Contract DASA01-71-C-0098

Descriptors: (*Underground structures, Blast), Cylindrical bodies, Structural shells, Loading(Mechanics), Shock waves, Numerical analysis, Nuclear explosions.
Identifiers: *Cylindrical shells, Finite difference theory, Finite element analysis.

An infinitely long cylindrical shell of nominal radius R0 (the target) is surrounded by a cylinder of a bilinear material of radius RL much greater than R0. The material behaves bilinearly in bulk but linearly in shear. The shell is treated as a linear oscillator of mass n per unit area and frequency omega. At a time t = 0, the outer surface of the material at RL is suddenly loaded by an axisymmetric pressure which decreases with time. The shock is followed to the target and the reflected shock is followed back to the outer surface RL. Interest is centered on the response of the target, so that the computation is stopped at the time that the reflected wave reaches RL. A pseudo - characteristic method is used for the computation. The results presented permit the independent checking of results from finite difference or finite element codes for the case of axisymmetric wave propagation. (Author)

CEA-R-4426/GA PC$9.75/MF$1.45
Commissariat a l'Energie Atomique, Vaujours (France). Centre d'Etudes.
STUDY OF UNDERGROUND CAVITIES.
J. Mandel. Jun 73, 151p
In French. U.S. Sales Only.

Descriptors: (*Cylinders, *Cavities), (*Spheres, Cavities), Elasticity, Gravitation, Low pressure, Plasticity, Rocks, Soils, Stability, Underground.

For abstract, see NSA 28 07, number 17732.

N73-30862/9GA PC$4.50/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
MATRIX PERTURBATION TECHNIQUES IN STRUCTURAL DYNAMICS.
T. K. Caughey. 1 Sep 73, 47p NASA-CR-133795, JPL-TM-33-652
Contract NAS7-100

Descriptors: *Matrices (Mathematics), *Perturbation theory, *Structural analysis, Canonical forms, Differential equations, Digital computers.

For abstract, see STAR 1121

ORNL-TM-4275/GA PC$6.50/MF$1.45
Oak Ridge National Lab., Tenn.
DYNOR: DYNAMIC ANALYSIS OF STRUCTURAL SYSTEMS.
R. M. Holmes. Jul 73, 89p
Contract W-7405-eng-26

Descriptors: (*Computer codes, *D codes), (*Mechanical structures, *Mechanical vibrations), Earthquakes, Fortran.

For abstract, see NSA 28 08, number 20583.

PB-224 423/4GA PC$4.75/MF$1.45
Illinois Univ., Urbana. Dept. of Civil Engineering.
STRESS-STRAIN RELATIONSHIPS OF REINFORCING BARS SUBJECTED TO LARGE STRAIN REVERSALS.
Civil engineering studies,
A. E. Aktan, B. I. Karlsson, and M. A. Sozen. Jun 73, 53p Structural Research Ser-397, UILU-ENG-73-2014
Grant NSF-GI-29934

Descriptors: (*Reinforcing steels, Stress strain diagrams), (*Earthquakes, *Reinforced concrete), Tensile strength, Tension tests, Test specimens, Extensometers, Strain measurement, Strains.
Identifiers: Strain reversal, Earthquake engineering, Computer aided analysis.

The report describes an analysis of results of cyclic loading tests on No. 6 and No. 9 reinforcing bars strained well into the yield range in both tension and compression.

PB-224 520/7GA PC$10.00/MF$1.45
California Univ., Berkeley. Earthquake Engineering Research Center.
RATE OF LOADING EFFECTS ON UNCRACKED AND REPAIRED REINFORCED CONCRETE MEMBERS,
Stephen A. Mahin, Vitelmo V. Bertero, M. Bilgin Atalay, and Dixon Rea. Dec 72, 160p EERC-72-9
Sponsored in part by National Science Foundation, Washington, D.C.

Descriptors: (*Cracks, Maintenance), (*Reinforced concrete, Cracks), (*Earthquake resistant structures, Design), Deformation, Failure, Strains, Reinforcing steels, Flexural strength, Epoxy resins, Test methods, Ductility, Stiffness, Performance evaluation.
Identifiers: Epoxy injection techniques.

The effect of high loading rates on the behavior of reinforced concrete structures and the effectiveness of the epoxy-injection technique of repairing cracks in such structures have been studied through tests on six simply-supported, doubly-reinforced, concrete beams. Zones of time-varying moment were developed in the specimens by imposing the same displacement histories at the third points of the beams with electronically controlled hydraulic actuators. Damage in two of the specimens was limited so that they could be repaired by the injection of epoxy resins into cracks and later retested. An additional steel wide flange beam was tested to evaluate the performance of the experimental facilities. Steel and concrete strains, curvatures, and deflections were continuously monitored and are presented in the appropriate hysteretic forms. The results are interpreted with specific regard to the effects of rate of loading and crack repair on the stiffness, strength, ductility, and energy absorption and dissipation capacities of the specimens.

PB-224 597/5GA PC$4.50/MF$1.45
Lehigh Univ., Bethleham, Pa. Fritz Engineering Lab.
INELASTIC RESPONSE FOR ARBITRARY HISTORIES OF BIAXIAL LOADS,
W. F. Chen, and T. Atsuta. Jan 72, 47p FEL-331.22
Grant NSF-GK-14272

Descriptors: (*Colums(Supports), Loads(Forces)), Biaxial stresses, Curvature, Deformation, Hysteresis, Strain measurement, Elastic properties, Stiffness, Cyclic loads, Bauchinger effect, Metals, Fatigue(Materials), Numberical analysis, Energy dissipation, Structural engineering.

A generalized stress strain relationship for biaxially loaded sections are presented. The generalized stresses are an axial force, two bending moments about the principal axes and a bi-moment (or a warping force). The corresponding generalized strains are an axial strain at the centroid, two bending curvatures and a warping curvature. The sections are cut into finite elements, for each of which the current strain and strain limits (elastic, plastic, strain hardening) are stored in the computer. The analysis is applicable to doubly symmetric sections. The material characteristics are assumed to be tri-linear, i.e., elastic, plastic and linear strain hardening. Only normal stresses are taken into account and shear stresses due to St. Venant torsion and warping torsion are neglected in the yield condition. Elastic unloading is included so that hysteresis relationships may be obtained which is available to low cycle fatique and shakedown analyses. Numerical examples are shown for wide flange sections under several loading paths and repeated loading. A good agreement is obtained in comparison with other reported results. (Author)

PB-224 635/3GA PC$5.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
RELIABILITY-BASED OPTIMUM DESIGN OF SIMPLE PLASTIC FRAMES.
Research rept.,
Erik H. Vanmarcke, Jorge Diaz-Padilla, and Dennis A. Roth. Aug 72, 62p R72-46, Structures Pub-347 NSF-GK-25510x-7
Grant NSF-GK-25510

Descriptors: (*Framed structures, Plastic analysis), Structural design, Optimization, Trusses, Design criteria, Loads(Forces), Failure, Iteration.

Reliability analysis and optimum reliability-based design are discussed and illustrated in this report. A new iterative optimization scheme is exploited where at each stage of the design process both upper and lower bounds on the true optimum value of the objective function are generated. The effects of stochastic dependence between the failure modes are taken into account.

PB-224 636/1GA PC$3.75/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
LIVE LOAD EFFECTS IN OFFICE BUILDINGS.
Research rept.,
Robin K. McGuire, and C. Allin Cornell. Jul 73, 90p* R73-28, Structures Pub-365 NSF-GK-25510X-14
Grant NSF-GK-25510

Descriptors: (*Office buildings, Dynamic loads), Loads(Forces), Probability theory, Building codes, Safety factor, Beams(Supports), Shear strength, Random variables.

Fractiles of office building live load effects deduced from a combination of recent statistical data and probabilistic models are compared with popular code recommendations for design loads and areal reduction factors. The effects of loaded area, shape of influence surface, and division into independently acting tenants are studied systematically. The conventional definition of tributary area is not the most statisfactory one available. Several alternative forms of code presentation of design loads are compared, including a naive but accurate probabilistic model.

PB-224 652/8GA PC$3.50/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
CREEP OF CONCRETE UNDER STOCHASTIC LIVE LOAD.
Research rept.,
Robin K. McGuire, and C. Allin Cornell. Oct 72, 51p* R72-68, Structures Pub-355 NSF-GK-25510X-11
Grant NSF-GK-25510

Descriptors: (*Beams(Supports), Creep properties), (*Concrete construction, Dynamic loads), Creep rate, Loads(Forces), Deflection, Random variables, Elastic analysis, Mathematical models.

The probabilistic deflection of concrete beams is modeled, taking into account the creep behavior of the concrete and the variability of gravity loads as modeled in recent live load studies (both in magnitude and in time). The creep parameters of the concrete are modeled as random variables, as are the magnitude and time between changes of live load, and the cross-sectional properties of the beam. Parameters describing concrete behavior are considered nonchanging with time (which is a valid assumption during most of a structure's life); extension of the model to include initial effects would not be difficult. The mean and variance of the beam deflection are calculated, as well as fractiles of the maximum lifetime deflection, taking into account discrete deflection changes due to changes in live load and continuous deflection changes due to the creep behavior of the concrete. Results are presented as a function of the mean rate of change of the stochastic live load.

PB-224 672/6GA PC$3.75/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
SETTLEMENT PREDICTION: A PROBABILISTIC APPROACH.
Research rept.,
Jorge Diaz-Padilla, and Erik H. Vanmarcke. Aug 73, 83p* R73-40, Structures Pub-375 NSF-GK-25510X-15
Contract C-2-36049, Grant NSF-GK-25510

Descriptors: (*Foundations, *Soil properties), (*Superstructures, *Settlement(Structural)), Cohesive soils, Stresses, Loads(Forces), Deformation, Probability theory, Random variables.
Identifiers: Soil structure interactions.

In the report, a probabilistic soil-structure interaction model is developed which yields first-order probabilistic information (i.e., means, standard deviations and correlation coefficients) about the movements of the foundation in terms of prescribed probabilistic input about loads and soil properties. The proposed method is applicable only to linear elastic structures supported on shallow foundations, but bounds are suggested for the means and standard deviations of the differential settlements in the case where settlement-induced stiffness deterioration occurs. The uncertainty of joint displacements and forces imposed on the structure by random deformation of its foundation is also discussed. (Author)

PB-224 742/7GA PC$4.00/MF$1.45
Lehigh Univ., Bethlehem, Pa. Fritz Engineering Lab.
TANGENT STIFFNESS METHOD FOR BIAXIAL BENDING OF REINFORCED CONCRETE COLUMNS,
W. F. Chen, and M. T. Shoraka. Oct 72, 40p FEL-389.1
Grant NSF-GK-35886

Descriptors: (*Columns(Supports), Bending moments), Loads(Forces), Plastic properties, Axial stress, Reinforced concrete, Computerized simulation, Structural engineering.
Identifiers: Biaxial bending, Computer aided design.

Analytical formulations and procedures are developed for computing moment-thrust-curvature relations for reinforced concrete column sections in biaxial bending. The cross section is partitioned by a rectangular grid into a large number of small elemental areas of steel and concrete. The moment-thrust-curvature relations are obtained by step-by-step application of the analytically developed linear force-deformation equation using the tangent stiffness iterative procedure. The method is found to be extremely powerful and efficient for computer solution. Numerical results are obtained for two types of loading paths: Given path of loading; and given mixed path of loading and deformation. Results are presented in the form of moment-curvature-thrust curves and interaction curves relating axial compression and biaxial bending moments. The important factors influencing the behavior of these curves are discussed such as strength of materials, percentage of reinforcement and the magnitude of compression force. Simple analytical expressions to approximate the interaction curves of square sections are obtained. (Author)

PB-224 744/3GA PC$4.50/MF$1.45
Lehigh Univ., Bethlehem, Pa. Fritz Engineering Lab.
INTERACTION CURVES FOR BIAXIAL BENDING OF PLASTIC COLUMNS,
W. F. Chen, and T. Atsuta. Jan 72, 46p FEL-331.21
Grant NSF-GK-14274

Descriptors: (*Columns(Supports), Plastic analysis), Biaxial stresses, Loads(Forces), Plastic properties, Rectangular bodies, Bending moments, Force, Structural steels.
Identifiers: Biaxial bending.

A simple method to obtain the exact interaction relationships of general sections which are composed of rectangular elements is presented. The section may be unsymmetric and the loads are combination of axial force and biaxial bending moments. The exactness of the solution is shown by the coincidence of the upper and lower bound solutions provided by the limit analysis. For illustrations, interaction curves for several commonly used structural steel sections are developed using the method. (Author)

TT-71-56014/GA PC$6.50/MF$1.45
National Oceanic and Atmospheric Administration, Rockville, Md.
EARTHQUAKE RESISTANT CONSTRUCTION,
S. V. Polyakov. 1973, 281p
Trans. of Seismostoikie Konstruktsii Zdanii, Moscow, 1969 326p, by Charles Braver.

Descriptors: (*Earthquake resistant structures, Research), Dynamic structural analysis, Stresses, Vibration, Degrees of freedom, Buildings, Loads(Forces), Walls, Correlation techniques, Structural design, Seismic detection, Translations, USSR.

Contents:
- Some propositions of structural dynamics;
- Some general observations on earthquakes and their action on buildings;
- Determination of seismic forces;
- Classification of building construction schemes--Calculation of horizontal seismic force distribution;
- Constructions of earthquake resistant buildings.

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-768 424/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ONERA WILL PUT A LARGE ANECHOIC CHAMBER WITH A WIND TUNNEL IN SERVICE IN 1975,
Jacques Morisset. 10 Oct 73, 12p Rept no. FTD-HC-23-57-74
Edited trans. of Air et Cosmos (France) v10 p23-25, 10 Feb 73.

Descriptors: (*Anechoic Chambers, Design), Wind tunnels, Acoustics, Structural parts, Installation, France.
Identifiers: Translations.

The report describes the structural components of an anechoic chamber under construction in France.

AD-768 748/6GA PC$2.75/MF$1.45
Naval Research Lab Washington D C
A RELIABLE PIEZOELECTRIC BALLISTIC IMPACT DETECTOR.
Final rept.,
Larry E. Ivey, and Theodore A. Henriquez. 25 Oct 73, 19p Rept no. NRL-7664

Descriptors: (*Piezoelectric transducers, Sensors), (*Impact prediction, Detectors), Projectiles, Impact, Firing tests(Ordnance), Targets, Acoustic impedance, Costs.

A unique piezoelectric device has been developed to meet the Army's need for a more effective and economical sensor for the hit detection system used on rifle and tank firing ranges. The new sensor was designed to replace a relatively expensive unit that works well on a sheet metal target but is difficult to install and is not adaptable to cheaper target materials. Field tests showed that the new sensor is not only a more effective impact detector than the original sensor, but is capable of discriminating against false indications that may be caused by muzzle blast, debris thrown against the target by near misses or short rounds, and vibrations from other causes such as wind. Costing less than half as much as the original sensor, the new unit promises the additional economies of low maintenance and replacement costs on the basis of its durable performance in rifle firing tests. (Modified author abstract)

AD-768 861/7GA PC$2.75/MF$1.45
Texas Univ Austin Applied Research Labs
OPERATING INSTRUCTIONS FOR CALIBRATED SOURCE,
Wiley S. Olsen. 30 Aug 73, 11p Rept no. ARL-TM-73-26
Contract N60921-73-C-0107

Descriptors: (*Signal generators, Instruction manuals), Radiofrequency generators, Pulse generators, Maintenance, Low frequency.
Identifiers: Captor project.

The memorandum describes a calibrated source which can transmit a continuous 52 kHz tone or a 30 msec pulse having a 100 msec pulse repetition period. The memorandum is intended to be used as an operating instruction and repair manual. (Modified author abstract)

AD-769 039/9GA PC$3.75/MF$1.45
Hamilton Standard Windsor Locks Conn
ELECTRO-STATIC TRANSDUCER PROGRAM.
Final rept. 12 Jun 72-19 Oct 73,
Richard K. Davenport. 19 Oct 73, 97p AFAPL-TR-73-86
Contract F33615-72-C-2090

Descriptors: (*Transducers, Meters), Sensors, Electrostatics, Capacitance bridges, High-temperature research, Feasibility studies.
Identifiers: Displacement.

The report describes the research and development of a high temperature electro-static transducer. A parallel plate breadboard unit was designed, built, and tested to evaluate the feasibility of the concept and the accompanying demodulation electronics. A study was then conducted to determine the configuration and materials for a high temperature unit. This resulted in the design and manufacture of a two-inch displacement transducer with cylindrical quartz elements supporting metalized patches. Moving contacts in the device were eliminated by conducting the electrical signal from the inner moving element by means of an inconnel spring. Test results obtained with the unit indicated that the transducer provides an accurate means of displacement measurements up to 600F. It is concluded that with minor modifications and continued testing, accurate displacement measurements could be obtained with this device at temperatures up to 1000F. (Author)

AD-769 056/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A DEVICE FOR DETERMINING THE AERODYNAMIC COMPONENTS (FORCES AND MOMENTS) OF AXISYMMETRIC BODIES IN A FLOW OF RAREFIED GAS,
V. Ya. Ponomarev. 18 Oct 73, 6p Rept no. FTD-HT-23-656-74
Edited trans. of Patent (USSR) 339 823 p1-2 1972, by John A. Miller.

Descriptors: (*Superaerodynamics, *Test equipment), (*Patents, USSR), Spheres, Fibers, Suspension devices, Torsion, Test methods, Bodies of revolution, Axially symmetric flow.
Identifiers: Torsion elimination, Translations.

The invention pertains to devices for determining the aerodynamic components of axisymmetric bodies in a flow of rarefied gas, particularly devices using a pendulum fiber suspension of the investigated model. The disadvantage of such devices is that before determining the aerodynamic characteristics of the basic model it is necessary to test for its torsion element. The purpose of the invention is to determine the aerodynamic characteristics using a means of eliminating the torsion element.

AD-769 057/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A DEVICE FOR ATTACHING A MODEL IN A SUBSONIC WIND TUNNEL,
A. S. Mozolkov, V. M. Bozhkov, and A. V. Makashin. 18 Oct 73, 5p Rept no. FTD-HT-23-657-74
Edited trans. of Patent (USSR) 339 882 p1-2 1972, by John A. Miller.

Descriptors: (*Wind tunnel models, Attachment), (*Patents, Supports), Model tests, Vacuum pumps, Walls, Convex bodies, USSR.
Identifiers: Suction cups, Translations.

Theinvention deals with suction cup type equipment designed for attaching a model airborne vehicle, used for tests, in the working section of a subsonic wind tunnel with a static pressure differing little from atmospheric pressure.

AD-769 059/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A METHOD FOR DETERMINING THE PRESSURE ON THE SURFACE OF A MODEL DURING AERODYNAMIC TESTING,
G. I. Maikapar, and D. V. Khalezov. 18 Oct 73, 5p Rept no. FTD-HT-23-659-73
Edited trans. of Patent (USSR) 343 173 p1-2, 1972, by John A. Miller.

Descriptors: (*Wind tunnel models, *Test equipment), (*Aerodynamics, *Patents), Temperature, Pressure, Coatings, Heat transfer, Time, Motion picture photography, USSR.
Identifiers: Pressure distribution, Translations, *Heat indicating coatings, Isotherm movements.

In experimental aerodynamics the familiar method of pressure determination limits the test capabilities due to the need for positioning a large number of sensors on the model. The present method obtains a continuous pressure distribution on models having complex shapes by coating a nonheat-conducting model with two heat-indicating coatings having different time dependent critical temperatures.

AD-769 068/8GA PC$3.50/MF$1.45
Southwest Research Inst San Antonio Tex
ENGINEERING APPRAISAL OF SOUTHWEST RESEARCH INSTITUTE MAGNETIC CRACK DEFINER APPLIED TO CH47 ROTOR BLADES,
J. Robert Birchak, Robert R. King, C. Gerald Gardner, and John R. Barton. Oct 73, 57p Rept no. SwRI-15-3653 USAAVSCOM-TR-73-20
Contract DAAJ01-73-C-0533

Descriptors: (*Non-destructive testing, Effectiveness), (*Cracks, Detection), (*Helicopters, Rotor blades(Rotary wings)), Fatigue(Mechanics), Magnetic detectors, Magnetic fields, Crack propagation, Failure(Mechanics).
Identifiers: H-47 aircraft, CH-47 aircraft.

The Magnetic Crack Definer (MCD), a nondestructive evaluation device recently developed at Southwest Research Institute, was evaluated to determine the applicability for detecting fatigue cracks in CH-47 helicopter rotor blade spars (AISI 4340) in the fully assembled blade. For test purposes, fatigue cracks were produced by cyclically stressing several sheet specimens cut from a spar from a scrap blade. Several different probe configurations and other system parameters of the MCD were investigated, and after optimizing overall design, cracks as small as 0.3-inch long by 0.025-inch deep were reliably detected under the major adverse conditions associated with the blade, namely: varying lift-off up to 0.10-inch; and different types of overlaying materials, including stainless steel, fiberglass, mastic and adhesive. Additional investigations are recommended to determine the capability for detecting fatigue cracks under the ferromagnetic steel doubler plates, and to determine possible sources of false alarms. (Author)

AD-769 100/9GA PC$4.50/MF$1.45
Defense Documentation Center Alexandria Va
NON-DESTRUCTIVE TESTING: RADIOGRAPHY.
Report bibliography Mar 64-Jun 73.
Nov 73, 131p* Rept no. DDC-TAS-73-66
Supersedes AD-733 860. See also AD-421 565.

Descriptors: (*Non-destructive testing, Radiography), (*Radiography, *Bibliographies), X rays, Gamma rays, Plastics, Crystals, Welds, Thickness, Metals, Test methods, Radioactivation analysis, Fatigue(Mechanics), Defects(Materials), Electronic equipment, Filament wound construction, Composite materials.

The bibliography is a compilation of unclassified-unlimited citations on Non-Destructive Testing: Radiography. References pertain to radiographic techniques for use in inspection and evaluation of electronic parts, metal fatigue, and filament wound materials. (Author)

AE-473/GA PC$4.00/MF$1.45
Aktiebolaget Atomenergi, Studsvik (Sweden).
SELECTIVE STEP SCANNING: A SIMPLE MEANS OF AUTOMATING THE PHILIPS DIFFRACTOMETER FOR STUDIES OF LINE PROFILES AND RESIDUAL STRESS.
A. Brown, and S. A. Lindh. Apr 73, 36p
U.S. Sales Only.

Descriptors: (*Powders, X-ray diffraction), (*X-ray diffraction, *Control systems), Computers, Motors, Strains, Stresses.

For abstract, see NSA 28 07, number 17708.

BDX-613-904/GA PC$3.00/MF$1.45
Bendix Corp., Kansas City, Mo.
LINEAR TRANSDUCER TIP PRESSURE CHECKER.
E. B. Cooper. Jun 73, 19p
Contract AT(29-1)-613

Descriptors: (*Transducers, *Design), (*Pressure gages, Design), Calibration, Performance, Testing.

For abstract, see NSA 28 07, number 17714.

CEA-CONF-2212/GA PC$6.75/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
AUTOMATIC MEASUREMENTS.
H. Roquefort. 1973, 91p
In French. U.S. Sales Only.

Descriptors: (*Measuring methods, *Computers), (*Automation, Computers), (*Data processing, Computers), Amplifiers, Analog-to-digital converters, Memory devices, Voltmeters.

For abstract, see NSA 28 07, number 17697.

COM-73-11578/4GA PC$6.25/MF$1.45
National Maritime Research Center--Galveston, Tex. Liquefied Natural Gas Program.
LIQUEFIED NATURAL GAS RESEARCH AND FACILITY REQUIREMENTS AT THE NATIONAL MARITIME RESEARCH CENTER, GALVESTON, TEXAS.
Technical rept. Oct 72-Feb 73,
Louis J. Poth. May 73, 85p NMRC 273-37000-R1

Descriptors: (*Liquefied natural gas, *Test facilities), (*Tanker ships, Liquefied natural gas), Research, Design, Safety, Test equipment, Cryogenics, Foam, Thermal insulation, Thermal shock, Cooling.

This report describes the requirements for liquefied natural gas (LNG) facilities at the National Maritime Research Center (NMRC)--Galveston. In establishing the requirements for facilities, the types of problems facing LNG tanker builders along with research tasks to solve the problems are described. In addition, the testing and facilities that are required to carry out the research are described. Instrumentation requirements for the test and safety are also discussed.

COM-73-50836/8GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Office of Weights and Measures.
EXAMINGATION PROCEDURE OUTLINES FOR COMMERCIAL WEIGHING AND MEASURING DEVICES. A MANUAL FOR WEIGHTS AND MEASURES OFFICIALS.
Handbook,
Otto K. Warnlof. Jun 73, 78p NBS-H-112
Paper copy available from GPO $1.10 as stock no. 0303-01162, C13.11:112.

Descriptors: (*Measuring instruments, *Manuals), Examination, Test methods, Inspection, Standards, Tolerances(Mechanics), Weight indicators.

The manual presents an operational guide for the field examination of commerical weighing and measuring devices. It includes inspection and test procedures, with code references to National Bureau of Standards Handbook 44, Fourth Edition, 'Specifications, Tolerances, and Technical Requirements for Commercial Weighing and Measuring Devices.'

COO-2204-2/GA PC$3.50/MF$1.45
Johns Hopkins Univ., Baltimore, MD. (Usa). Dept. Of Mechanics and Materials Science.
ACOUSTIC EMISSION AND DISCONTINUOUS YIELDING.
W. F. Hartman. 1971, 27p CONF-730810-2

Descriptors: (*Aluminium, Acoustic emission testing), (*Brass, Acoustic emission testing), (*Acoustic emission testing, *Yield strength), Annealing, Deformation, Elasticity, Portevin-le chatelier effect, Strains, Stresses, Tensile properties.

For abstract, see NSA 28 08, number 20613.

HEDL-SA-528/GA PC$3.50/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
HIGH FREQUENCY INSTRUMENT FOR MATERIAL STRAIN MEASUREMENTS.
T. R. Billeter. 6 Apr 73, 29p CONF-730611-12
Contract AT(45-1)-2170

Descriptors: (*Strain gages, *Design), (*Fuel cans, *Strains), Accuracy, High temperature, In core instruments, Microwave equipment, Performance testing, Resonance.

For abstract, see NSA 28 07, number 15648.

LBL-1802/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.

SOME CURRENT AND FUTURE TRENDS OF HIGH VOLTAGE TRANSMISSION ELECTRON MICROSCOPY.
G. Thomas. Mar 73, 6p CONF-730816-1
Contract W-7405-eng-48

Descriptors: (*Silicon, *Ion implantation), (*Lunar materials, *Domain structure), Crystal defects, Electron microscopy, Mev range 01-10.

For abstract, see NSA 28 08, number 20626.

MHSMP-73-38/GA PC$3.00/MF$1.45
Mason and Hanger-Silas Mason CO., Inc., Amarillo, Tex.
COMPRESSED GAS CYLINDER DRYING APPARATUS.
J. B. Pennington. 19 Jun 73, 11p

Descriptors: (*Gas cylinders, *Drying), (*Laboratory equipment, *Performance), Air, Storage.

For abstract, see NSA 28 08, number 18155.

MLM-1940/GA PC$4.00/MF$1.45
Mound Lab., Miamisburg, Ohio.
FLUIDIC NONCONTACT GAGING.
W. R. Schurman, and G. L. Coons. 15 Jun 73, 24p
Contract AT-33-1-Gen-53

Descriptors: (*Detonators, *Powders), Air, Explosives, Fluid flow, Inspection, Logic circuits, Low pressure, Machine tools, Measuring methods, Pressure gages.

For abstract, see NSA 28 07, number 17782.

N73-30218/4GA PC$11.50/MF$1.45
LTV Aerospace Corp., Dallas, Tex. Vought System Div.
EXTRAVEHICULAR MOBILITY UNIT THERMAL SIMULATOR.
Final Report.
C. W. Hixon, and M. A. Phillips. 31 Jul 73, 189p
NASA-CR-134005, T155-03
Contract NAS9-7644

Descriptors: *Computerized simulation, *Extravehicular activity, *Thermodynamic properties, Command modules, Computer programs, Finite difference theory, Heat transfer.

For abstract, see STAR 1121

N73-30219/2GA PC$8.25/MF$1.45
LTV Aerospace Corp., Dallas, Tex. Vought Systems Div.
EXTRAVEHICULAR MOBILITY UNIT THERMAL SIMULATOR FOR J MISSION.
C. W. Hixon, and M. A. Phillips. 31 Jul 73, 123p
NASA-CR-134006, T155-04
Contract NAS9-7644

Descriptors: *Computerized simulation, *Extravehicular activity, *Thermodynamic properties, Command modules, Computer programs, Finite difference theory, Heat transfer.

For abstract, see STAR 1121

N73-30220/0GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THE V-3 CONTAMINATION TEST OF THE CHAMBER A FACILITY AND A SUBSEQUENT CRYOGENIC/VACUUM STUDY OF THE V-3 TEST QUARTZ CRYSTAL MICROBALANCE.
W. W. Moore, Jr., and P. W. Tashbar. 30 Mar 73, 45p NASA-TM-X-64776

Descriptors: *Contamination, *Microbalances, *Quartz crystals, *Vacuum chambers, Cryogenics, Environmental tests, Test facilities.

For abstract, see STAR 1121

N73-30221/8GA PC$7.75/MF$1.45
McDonnell-Douglas Electronics Co., St. Charles, Mo.
SPACE SHUTTLE VISUAL SIMULATION SYSTEM DESIGN STUDY.
20 Jul 73, 112p NASA-CR-134020, MSC-06741
Contract NAS9-12651

Descriptors: *Space shuttles, *Space simulators, *Training devices, *Visual aids, Cost analysis, Equipment specifications, Systems analysis.

For abstract, see STAR 1121

N73-30350/5GA PC$3.00/MF$1.45
Kansas Univ. Center for Research, Inc., Lawrence.
AN EFFICIENT TECHNIQUE FOR DETERMINING APPARENT TEMPERATURE DISTRIBUTIONS FROM ANTENNA TEMPERATURE MEASUREMENTS.
J. P. Claassen, and A. K. Fung. Sep 73, 33p
NASA-CR-2310, TR-186-8
Contract NAS1-10048

Descriptors: *Antenna radiation patterns, *Temperature distribution, Cross coupling, Microwave radiometers, Polarization characteristics, Temperature inversions, Weighting functions.

For abstract, see STAR 1121

N73-30435/4GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
A MODIFIED QUADRUPOLE MASS SPECTROMETER WITH CUSTOM RF LINK RODS DRIVER FOR REMOTE OPERATION.
P. W. Tashbar, D. B. Nixon, and W. W. Moore, Jr.. Aug 73, 27p NASA-TM-X-64775

Descriptors: *Mass spectrometers, *Quadrupoles, *Space simulators, *Thermal vacuum tests, Apollo telescope mount, Oscillators, Payloads.

For abstract, see STAR 1121

N73-30439/6GA PC$3.00/MF$1.45
Defence Research Information Centre, Orpington (England).
IR TECHNOLOGY SHOWS UP DEFECTS WITH HEAT.
J. Ahlstroem. Apr 73, 14p DRIC-TRANS-3179, BR30524
Tran-Transl. Into English from Elteknik Med. Aktuell Elektronik Sweden, V. 12, Dec. 1972, p 16-19.

Descriptors: *Infrared detectors, *Photometers, *Temperature measuring instruments, Infrared radiation, Thermistors.

For abstract, see STAR 1121

N73-30500/5GA PC$4.25/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
BIBLIOGRAPHY ON STRESS WAVE EMISSION, 1950 - 1972.
G. G. Martin. Feb 73, 41p ARL/MET-BIBL-1

Descriptors: *Bibliographies, *Stress waves, Acoustic measurements, Fracture mechanics, Nondestructive tests, Stress corrosion, Thermal shock.

For abstract, see STAR 1121

N73-30820/7GA PC$3.00/MF$1.45
Royal Greenwich Observatory, Herstmonceux (England). Time and Latitude Service.
GREENWICH TIME REPORT.
Quarterly Report, Jul. - Sep. 1972.
Sep 72, 17p

Descriptors: *Latitude, *Radio astronomy, *Universal time, Frequency standards, Radio signals.

For abstract, see STAR 1121

N73-31345/4GA PC$3.00/MF$1.45
Royal Greenwich Observatory, Herstmonceux (England).
TIME AND LATITUDE SERVICE, JANUARY - MARCH 1973.
Mar 73, 19p

Descriptors: *Latitude measurement, *Tables (Data), *Time measurement, Frequency measurement, Periodic variations.

For abstract, see STAR 1122

N73-31416/3GA PC$10.00/MF$1.45
Florida Univ., Gainesville. Dept. of Mechanical Engineering.
HYDROGEN AND OXYGEN SENSOR DEVELOPMENT.
Final Report.
E. A. Farber, J. Mahig, and H. R. A. Schaeper. 31 Oct 72, 158p NASA-CR-133891
Contract NAS10-1255

Descriptors: *Gas detectors, *Hydrogen, *Nitrogen, *Oxygen, Gas mixtures, Helium, Oscillators, Systems engineering.

For abstract, see STAR 1122

N73-31419/7GA PC$3.75/MF$1.45
Max-Planck-Institut fuer Stroemungsforschung, Goettingen (West Germany).
OSCILLATION ANEMOMETER.
J. Kielbasa. 1972, 32p REPT-9/1972
In German; English Summary.

Descriptors: *Hot-wire anemometers, *Transit time, Flow velocity, Gas flow, Oscillations.

For abstract, see STAR 1122

N73-31424/7GA PC$8.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany). Abteilung Stroemungen geringer Dichte und hoher Enthalpie.
SIMULATION OF A ROCKET ASCENT IN THE 65 TO 90 KM ALTITUDE RANGE FOR PERFORMANCE TEST OF A CRYOCOOLED MASS SPECTROMETER IN THE DFVLR ARC HEATED WIND TUNNEL PK2 SIMULATION DES AUFSTIEGS EINER RAKETE IM HOEHENBEREICH VON 65 BIS 90 KM ZUR FUNKTIONSERPROBUNG EINES KRYOGEKUEHLTEN MASSENSPEKTROMETERS IM DFVLR-PLASMAWINDKANAL PK2.
K. Stursberg, W. Krahn, and W. Karnatschke. 27 Jul 72, 118p DLR-MITT-72-23
In German; English Summary.

Descriptors: *Altitude tests, *Mass spectrometers, *Plasma jet wind tunnels, *Rocket flight, *Rocket-borne instruments, Arc heating, Flight simulation, Liquid cooling, Liquid helium, Supersonic flow.

For abstract, see STAR 1122

N73-31441/1GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NONDESTRUCTIVE EVALUATION TECHNIQUE GUIDE.
A. Vary. 1973, 110p NASA-SP-3079

Descriptors: *Methodology, *Nondestructive tests, Catalogs (Publications), Categories, Tables (Data).

For abstract, see STAR 1122

N73-31479/1GA PC$4.75/MF$1.45
Zeiss (Carl), Oberkochen (West Germany).
HOLOGRAPHIC INTERFEROMETRY (REAL-TIME) HOLOGRAPHISCHE REAL-TIME INTERFEROMETRIE.
A. F. Fercher, M. Kriese, P. Kunstmann, and H. Sprongl. Apr 73, 54p BMFT-FB-T-73-01
Subm-Sponsored by Bundesmin. Fuer Forsch. Und Technol.
In German; English Summary.

Descriptors: *Holographic interferometry, *Mirrors, *Quality control, *Real time operation, Astronomical telescopes, Data storage, Photochromism, Silver halides, Surface properties, Wave front reconstruction.

For abstract, see STAR 1122

N73-31529/3GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SENSITIVITY AND COMPARISON EVALUATION OF SATURN 5 LIQUID PENETRANTS.
G. H. Jones. 27 Jul 73, 53p NASA-TM-X-64769

Descriptors: *Liquids, *Penetrants, *Saturn 5 launch vehicles, *Surface cracks, Densitometers, Photographic film, Radiography, Sensitivity.

For abstract, see STAR 1122

PAT-APPL-332529/GA PC$3.00/MF$1.45
Martin Marietta Corp., Orlando, Fla. Advanced Technology Dept.
TEMPERATURE MEASUREMENT SYSTEM.
Patent Application.
F. C. Deal. Filed 14 Feb 73, 11p NASA-CASE-MFS-20781-2,
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Heat transfer, *Infrared radiation, *Temperature control, *Welding, Equipment specifications, Patent applications, Radiation measurement.

Systems for the measurement and control of fairly high temperatures are described, particularly the measurement of the temperature of welds. The control of welding equipment to heat materials to be welded, in accordance with a desired temperature-time profile, is also discussed. The basic novelty of the invention lies in the separate detection of discrete bands of infrared radiation from the object or objects being heated and then computing the ratio of the magnitudes of these bands. In this way a true indication of temperature is obtained which does not depend upon the magnitude of radiation sensed and is thus a more accurate system of temperature measurement. A second aspect of the invention is the use of stored IR temperature-time profile data from previous successful test welds for control of the system.

PAT-APPL-386793/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
HOLOGRAPHIC SYSTEM FOR NONDESTRUCTIVE TESTING.
Patent Application.
R. L. Kurtz. Filed 8 Aug 73, 14p NASA-CASE-MFS-21704-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Holography, *Nondestructive tests, *Systems engineering, Patent applications, Photographic equipment.

A holographic system for nondestructive testing of objects and producing detailed holograms of the test object despite its movement is described. The system consists of a positionable mirror that provides illumination of the object at various angles. Holograms are produced with varying degrees of sensitivity by changing the illumination angle on the test object. Such a procedure allows optimum observation of dimensions of deformation of an object occuring between test exposures.

PATENT-3 394 286/GA Not available NTIS
National Research Corp., Cambridge, Mass.
ULTRAHIGH VACUUM MEASURING IONIZATION GAUGE.
Patent.
F. J. Brock. Patented 23 Jul 68, 4p NASA-CASE-XLA-05087,
Misc-Filed 27 May 1965. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Ionization gages, *Vacuum gages, Electrodes, Ion extraction, Modulators, Patents.

The ionization gage described consists of separate ionization and collector regions connected at an exit area with a modulator electrode. In addition to the standard modulation function, the modulator in this location yields a suprising increase in collector current, apparently due to improved focussing and extraction of ions from the ionization region.

PATENT-3 395 565/GA Not available NTIS
National Research Corp., Cambridge, Mass.
GAUGE CALIBRATION BY DIFFUSION.
Patent.
F. J. Brock, and F. Feakes. Patented 6 Aug 68, 7p NASA-CASE-XGS-07752,
Misc-Filed 11 Mar. 1966. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Calibrating, *Pressure measurements, *Ultrahigh vacuum, *Vacuum gages, Diffusion, Gas flow, Patents.

Vacuum gage calibration by diffusing a known quantity of gas through a heated barrier into a gauge is examined. The gas flow raises the pressure in the gauge to known level and is then compared with the gauge's pressure reading.

PATENT-3 446 075/GA Not available NTIS
National Research Corp., Cambridge, Mass.
APPARATUS FOR ABSOLUTE PRESSURE MEASUREMENT.
Patent.
R. Hecht. Patented 27 May 69, 8p NASA-CASE-LAR-10000,
Misc-Filed 1 Feb. 1967. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Gas density, *High vacuum, *Manometers, *Measuring instruments, *Pressure measurements, Electric fields, Patents, Pressure sensors, Stiffness.

An absolute pressure sensor (e.g., the diaphragm of a capacitance manometer) was subjected to a superimposed potential to effectively reduce the mechanical stiffness of the sensor. This substantially increases the sensitivity of the sensor and is particularly useful in vacuum gauges. An oscillating component of the superimposed potential induced vibrations of the sensor. The phase of these vibrations with respect to that of the oscillating component was monitored, and served to initiate an automatic adjustment of the static component of the superimposed potential, so as to bring the sensor into resonance at the frequency of the oscillating component. This establishes a selected sensitivity for the sensor, since a definite relationship exists between resonant frequency and sensitivity.

PATENT-3 498 112/GA Not available NTIS
Department of the Navy Washington D C
MICROWAVE SYSTEM FOR DETERMINING WATER CONTENT IN FUEL OIL.
Patent,
Dean D. Howard. Filed 30 Apr 68, patented 3 Mar 70, 5p Rept nos. PAT-APPL-725 353,
Government-owned invention available for licensing, Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Monitors, Fuel oil), (*Patents, Monitors), Non-destructive testing, Microwave equipment, Millimeter waves, Attenuation, Moisture, Sea water.
Identifiers: PAT-CL-73-61-1.

The patent describes an apparatus for determining the water content of fuel oil. Microwave energy is directed through a chamber through which the fuel oil passes and a measure of the attenuation of the microwave energy is made. The attenuation of microwave energy as it passes through the oil determines the amount of water contamination within the oil. The system operates in the millimeter wave range where there is little attenuation caused by uncontaminated oil and a high attenuation caused by even small amounts of water contamination.

PATENT-3 498 124/GA Not available NTIS
Department of the Navy Washington D C
APPARATUS FOR MEASURING TENSION IN A RUNNING LINE OF MAGNETIC MATERIAL.
Patent,
Herman A. Soulant. Filed 26 Dec 67, patented 3 Mar 70, 4p Rept nos. PAT-APPL-693 396,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D. C. 20231 $0.50.

Descriptors: (*Test equipment, Stresses), (*Patents, Test equipment), Cables(Mechanical), Tensile properties, Magnetic fields, Non-destructive testing.
Identifiers: Tension, PAT-CL-73-143.

The patent describes a device for measuring tension in a magnetically conductive member which provides for generation of a magnetic field around the member and a pickup magnetically coupled to the member. The output of the pickup is directly proportional to the tension in the member coupling the magnetic field to the pickup.

PATENT-3 499 315/GA Not available NTIS
Department of the Navy Washington D C
CONTAMINATION DETERMINATION IN A FLUID SYSTEM.
Patent,
Joseph A. Marino. Filed 31 Aug 67, patented 10 Mar 70, 3p Rept nos. PAT-APPL-665 684,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Filters(Fluid), *Contamination), (*Patents, Filters(Fluid)), Pressure, Measurement.
Identifiers: PAT-CL-73-61.

It is a principal object of the present invention to provide a novel method and apparatus whereby the contaminant content of a fluid system can be determined in a very short period of time by non-technical personnel. It is another object of the invention to provide an improved method whereby the fluid sample tested may approach the total system volume and thereby obtain increased accuracy. The determination is obtained at the fluid system location and results are immediate so that a maximum utilization may be made of the information.

PATENT-3 500 191/GA Not available NTIS
Department of the Navy Washington D C
MICROCIRCUIT TEST PROBE WITH GRAPPLER.
Patent,
Eugene E. Gick. Filed 7 Dec 67, patented 10 Mar 70, 3p Rept nos. PAT-APPL-688 729,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Probes(Electromagnetic), *Integrated circuits), (*Patents, Probes(Electromagnetic)), Microminiaturization(Electronics), Test equipment(Electronics).
Identifiers: Microelectronics, PAT-CL-324-72-5.

The patent provides a simple device for testing microelectronic components without causing breakage or short circuits. The invention is a test probe to hook onto or into a circuit, particularly a microcircuit, without discontinuing the current flow within the circuit. A tapered plug which normally is spring biased into abutment with a hook portion of the contact end of the test probe is manually withdrawn to expose the hook portion for enabling engagement with the circuit.

PATENT-3 733 130/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
SLOTTED PROBE FOR SPECTROSCOPIC MEASUREMENTS.
Patent,
Jack P. Young. Filed 7 Mar 72, patented 15 May 73, 5p PAT-APPL-232 488
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Patents, *Colorimeters), (*Spectrophotometers, Patents).
Identifiers: PAT-CL-356-74.

The invention provides an optical measuring device which can be used for making colorimetric or absorption spectral measurements in a process stream or sample wherein transmission of beam energy through a sample as well as attenuated total reflection is used to obtain absorption information.

PATENT-3 738 171/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
ATTENUATION COMPENSATION FOR ULTRASONIC THERMOMETERS.
Patent,
Robert L. Shapard, and Albert H. Malone. Filed 26 Apr 72, patented 12 Jun 73, 5p PAT-APPL-247 532
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Temperature measuring instruments, *Nuclear fuel elements), (*Patents, Temperature measuring instruments), Ultrasonic radiation, Direct current.
Identifiers: PAT-CL-73-339-A, Ultrasonic attenuation.

The patent describes a current source and control circuit used to supply a DC bias current to the driver coil of an ultrasonic thermometer. The magnitude of the ultrasonic echo signal is thereby increased by more than a factor of two and the upper temperature sensing limit, which is due in large part to sound attenuation in the sensor, is raised. These can be used for in-pile fuel temperature measurements in high temperature nuclear reactors.

PATENT-3 745 475/GA Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MEASUREMENT SYSTEM.
Patent.
J. W. Turner. Patented 10 Jul 73, 7p NASA-CASE-MFS-20658-1,
Misc-Filed 7 Dec. 1971 Supersedes N72-20407 (10 - 11, p 1474).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Frequency measurement, *Signal processing, *Systems engineering, Digital systems, Patents, Sampling, Sequential analysis, Signal detection.

A measurement system is described for providing an indication of a varying physical quantity represented by or converted to a variable frequency signal. Timing pulses are obtained marking the duration of a fixed number, or set, of cycles of the sampled signal and these timing pulses are employed to control the period of counting of cycles of a higher fixed and known frequency source. The counts of cycles obtained from the fixed frequency source provide a precise measurement of the average frequency of each set of cycles sampled, and thus successive discrete values of the quantity being measured. The frequency of the known frequency source is made such that each measurement is presented as a direct digital representation of the quantity measured.

PATENT-3 750 016/GA Not available NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
RF-SOURCE RESISTANCE METERS.
Patent.
E. C. Oakley. Patented 31 Jul 73, 6p NASA-CASE-NPO-11291-1,
Misc-Filed 19 Feb. 1971 Supersedes N72-10378 (10 - 01, p 0054). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Electrical resistance, *Measuring instruments, *Radio frequencies, Circuits, Patents, Potentiometers (Instruments), Resistors.

Several embodiments of RF source resistance measuring devices are disclosed. Common to all embodiments in the feature of the inclusion of at least one variable resistor, and a peak readout meter. In one embodiment, two ganged unloaded potentiometers are employed while another embodiment comprises an automaticnulling RF power bridge circuit with a variable rather than a fixed bridge reference resistance. A third embodiment comprises a calorimeter with a varible rather than a fixed resistor, while in another embodiment attenuator pads with variable resistors are employed.

N73-30476/8GA Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
HOLOGRAPHIC THIN FILM ANALYZER.
Patent.
J. R. Williams, and B. N. Norden. Patented 10 Jul 73, 5p NASA-CASE-MFS-20823-1, PATENTED-3 744 912
Misc-Filed 30 Aug. 1971 Supersedes N72-10431 (10 -01, p 0063).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Holography, *Measuring instruments, *Thin films, Coatings, Electromagnetic interference, Lasers, Patents.

For abstract, see STAR 1121

PB-224 645/2GA PC$3.00/MF$1.45
National Bureau of Standards, Washington, D.C.
RESPONSE CHARACTERISTICS OF A PORTABLE X-RAY FLUORESCENCE LEAD DETECTOR: DETECTION OF LEAD IN PAINT.
Final rept.,
Joe C. Spurgeon. Jun 73, 37p* NBSIR-73-231

Descriptors: (*Lead(Metal), *X ray fluorescence), (*X ray spectrometers, Performance evaluation), Calibration, Chemical analysis, X ray analysis, Portable equipment, Paints.
Identifiers: X ray fluorescence spectroscopy, *Lead based paints.

The objective of this investigation was to obtain an indication of the validity of the field data resulting from the use of portable x-ray fluorescence lead detectors by local lead paint detection programs. The response characteristics of such an instrument to conditions that are related to those encountered in the field have been investigated and the results are presented in this report. The affects of calibration standards, state of charge, paint overlayers, substrate, and distance on instrument response are discussed, in addition to the limit of detection and precision. The accomplishment of these tasks required the development of panel-type lead calibration standards. These standards encompass the concentration range from 0.1 mg/sq cm to 9.0 mg/sq cm. (Modified author abstract)

SLA-73-429/GA PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
CALIBRATION TECHNIQUES AND COMPUTER CODES FOR AUTOMATED LARGE-SIGNAL MICROWAVE S-PARAMETER MEASUREMENTS.
R. J. Chaffin, and W. H. Leighton. May 73, 28p

Descriptors: (*Electronic equipment, *Calibration), Computer codes, Data acquisition, Data processing, Errors, Microwave radiation, Pdp computers.

For abstract, see NSA 28 07, number 17805.

SLL-73-15/GA PC$4.00/MF$1.45
Sandia Labs., Livermore, Calif.
EFFECT OF RESIDUAL INPLANE STRESS IN THE TARGET RESULTING FROM FLYER-TARGET IMPACT.
M. R. Birnbaum, and L. M. Murphy. Jun 73, 36p
Contract AT(29-1)-789

Descriptors: (*Targets, *Stresses), (*Mechanical structures, *Impact tests), Deformation, Missiles, Shells, Velocity.

For abstract, see NSA 28 07, number 17813.

TID-26350/GA PC$3.00/MF$1.45
Purdue Univ., Lafayette, Ind.
TRANSFER OF EXCESS EQUIPMENT TO TPRC.
5p
Contract AT(11-1)-2159

Descriptors: (*Solids, *Thermodynamic properties), Equipment, Measuring instruments.

For abstract, see NSA 28 07, number 15428.

UCRL-51380/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
REVIEW OF FRACTURE TOUGHNESS METHODS.
M. E. Prado. 25 Apr 73, 19p
Contract W-7405-eng-48

Descriptors: (*Fractures, *Testing), (*Cracks, Testing), Design, Fractography, Materials testing, Mechanics, Reviews.

For abstract, see NSA 28 07, number 17822.

UR-3490-172/GA PC$6.00/MF$1.45
Rochester Univ., N. Y. Dept. Of Radiation Biology and Biophysics.
CYLINDRICAL AEROSOL SPECTROMETER.
M. I. Tillery. 1972, 77p

Descriptors: (*Spectrometers, Aerosols), (*Aerosols, *Particle size), Calibration, Cylindrical configuration, Resolution, Rotation.

For abstract, see NSA 28 07, number 17826.

14C. Recording Devices

PAT-APPL-177985/GA PC$4.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
RECORDER/PROCESSOR APPARATUS.
Patent Application.
I. H. Shim, and J. J. Stelben. Filed 7 Sep 71, 55p NASA-CASE-GSC-11553-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Data processing equipment, *Imaging techniques, *Optical data processing, Display devices, Lasers, Optical equipment, Patent applications, Recording instruments.

An apparatus is reported for recording a data input on a thermally processible storage medium in which a light source, such as a modulated laser beam whose intensity is modulated in response to the incoming data input, is caused to generate a raster in conformance with incoming timing/control signals so as to expose a latent image of the input information on the storage medium. A rotating drum in conjunction with an incrementally driven lens carriage associated with the laser optical system provides the raster generation. The drum is automatically loaded with the storage medium and automatically unloaded to a thermal processor upon completion of recording. The latent image is processed by the controlled application of heat so as to produce an actual displayable image corresponding to the data input at the output of the apparatus.

PAT-APPL-187143/GA PC$3.50/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
LASER BEAM INTENSITY CONTROL FOR THERMOMAGNETIC RECORDING AND MAGNETO-OPTIC PLAYBACK SYSTEMS.
Patent Application.
G. W. Lewicki, and J. E. Guisinger. Filed 6 Oct 71, 27p NASA-CASE-NPO-11317-2,
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Lasers, *Magnetic recording, *Magneto-optics, *Playbacks, Amplitudes, Faraday effect, Isotropic media, Kerr magnetooptical effect, Magnetic fields, Patent applications, Thermomagnetic effects.

A system is presented for maintaining the intensity of a laser beam substantially constant in a thermomagnetic recording and magneto-optic playback system in which an isotropic film is heated along a continuous path by the laser beam for recording. As each successive area of the path is heated locally to the vicinity of its Curie point in the presence of a controlled magnetic field, a magneto-optic density is produced proportional to the amplitude of the controlled magnetic field. To play back the recorded signal, the intensity of the laser beam is reduced and a Faraday or Kerr effect analyzer is employed, with a photodetector, as a transducer for producing an output signal. The light intensity of the laser beam is continuously detected close to the analyzer, particularly during playback operation, and compared with a reference to maintain intensity substantially constant.

14D. Reliability

AD-768 363/4GA PC$3.00/MF$1.45
Polytechnic Inst of Brooklyn N Y Dept of Electrical Engineering and Electrophysics
REDUNDANT SPARES ALLOCATION TO REDUCE RELIABILITY COSTS,
Sharad G. Sinkar, and Leonard Shaw. 1 Sep 73, 43p Rept no. EER-104
Contract N00014-67-A-0438-0012

Descriptors: (*Reliability(Electronics), Optimization), (*Redundant components, Spare parts), Failure(Electronics), Costs, Probability, Replacement theory, Modules(Electronics), Computer programs, Integrated circuits, Inventory control.
Identifiers: Allocation models, Failure rate functions.

Due to rapid developments in technology, provision of adequate number of spares at the time of acquisition of equipment has become a significant problem. Increased complexities of modern electronic equipments have resulted in modular designs. In the event of failure of one such a module, it is readily removed and replaced by a new one from the inventory. The problem considered here is the optimal selection of the inventory of spares for a system build from two kinds of modules, the larger of which can be connected so it performs the role of the smaller one. The optimal inventory is the least costly one which achieves a specified probability that the spares will not be exhausted over the design lifetime. For some costs and failure rates it is most economical to use the larger module for both roles because of the resulting increase in flexibility in the deployment of a single type of spare module. The problem has been approached by analytical as well as simulation methods. (Author)

AD-768 508/4GA Reprint
Florida State Univ Tallahassee Dept of Statistics
SHOCK MODELS AND WEAR PROCESSES,
J. D. Esary, A. W. Marshall, and F. Proschan. 2 Feb 73, 24p AFOSR-TR-73-1898
Grant AF-AFOSR-2058-71
Prepared in cooperation with Rochester Univ., N.Y. Dept. of Statistics, and Naval Postgraduate School, Monterey, Calif. Revision of report dated 15 Mar 71.
Availability: Pub. in The Annals of Probability, v1 n4 p627-649 1973.

Descriptors: (*Reliability, Stochastic processes), Shock(Mechanics), Life expectancy, Probability density functions, Mathematical models, Theorems.
Identifiers: Renewal theory.

The life distribution H(t) of a device subject to shocks governed by a Poisson process is considered as a function of the probabilities (P sub k) of not surviving the first k shocks. Various properties of the discrete failure distribution (P sub k) are shown to be reflected in corresponding properties of the continuous life distribution H(t). As an example, if (P sub k) has discrete increasing hazard rate, then H(t) has continuous increasing hazard rate. Properties of (P sub k) are obtained from various physically motivated models, including that in which damage resulting from shocks accumulates until exceedance of a threshold results in failure. The authors extend their results to continuous wear processes. Applications of interest in renewal theory are obtained. Total positivity theory is used in deriving many of the results. (Modified author abstract)

AD-768 585/2GA PC$5.50/MF$1.45
Texas A and M Univ College Station
THE USE OF LAGRANGIAN MULTIPLIERS FOR OPTIMUM RELIABILITY ALLOCATION.
Master's thesis,
Robert A. Davison. Feb 72, 69p

Descriptors: (*Reliability, Optimization), Redundant components, Mathematical models, Probability density functions, Costs, Programming(Computers), Theses, Army equipment.
Identifiers: Lagrange multipliers, Weibull density functions, Resource allocation, Failure rate functions.

The paper develops a method to allocate reliability to system elements where a system reliability requirement must be met or a total cost constraint is imposed. Parallel and serially arranged elements are considered with each element's probability density function of time to failure being approximated by the two parameter Weibull distribution. The problem is approached as a minimization of total system cost or system unreliability and Lagrange multipliers prove to be useful as a solution technique. A cost function is developed to relate the cost of and element to the reliability level achieved in that element. Both the element's cost function and reliability expression must be continuous variables. Numerical examples are shown for each allocation model. (Author)

AD-768 594/4GA PC$3.25/MF$1.45
Florida State Univ Tallahassee Dept of Statistics
RELIABILITY GROWTH.
Interim rept.,
Frank Proschan. Sep 73, 25p Rept nos. FSU-Statistics-M271, TR-13 AFOSR-TR-73-1910
Grant AF-AFOSR-2581-74

Descriptors: (*Reliability, *Multivariate analysis), Stochastic processes, Random variables, Growth, Optimization.

In the paper, the author discusses, interprets, and illustrates the Birnbaum measure of the importance of each component in a coherent system. It is shown how this measure of component importance can be used to determine system reliability growth from component reliability growth. Finally, an algorithm is illustrated to calculate the optimum amount of effort to expend on improving individual component reliabilities so as to achieve a desired system reliability growth at minimum total cost for reliability growth. (Modified author abstract)

AD-768 765/0GA PC$6.00/MF$1.45
Army Materiel Command Texarkana Tex Intern Training Center
AN INVESTIGATION OF THE EFFECTS OF INCOMING QUALITY AND INSPECTION RATE ON INSPECTOR ACCURACY,
Richard A. Paladino. Jul 71, 77p Rept no. USAMC-ITC-2-71-08

Descriptors: (*Quality control, Printed circuits), Reliability(Electronics), Multivariate analysis, Analysis of variance, Experimental design, Accuracy.
Identifiers: *Product inspection.

In order to obtain information to study the effects of incoming qaulity and inspection rate on inspector accuracy, eight subjects inspected printed circuits for defects, at various combinations of incoming quality and inspection rate. The results obtained indicate that inspector accuracy was affected by the incoming quality of the items, but the manner in which it was affected depended on the measure of inspector accuracy that was used. The effect of inspection ration accuracy was very pronounced and indicated that higher accuracies are associated with slower inspection rates and vice versa. The study concludes with recommendations for more research in the area of inspector accuracy, and a discussion of the problems encountered in trying to determine inspector accuracy. (Modified author abstract)

14E. Reprography

N73-30425/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
FORMULATION OF IMAGE QUALITY PREDICTION CRITERIA FOR THE VIKING LANDER CAMERA.
F. O. Huck, D. J. Jobson, E. J. Taylor, and S. D. Wall. Sep 73, 20p NASA-TM-X-2802, L-8928

Descriptors: *Cameras, *Imaging techniques, *Viking mars program, Computer programs, Photoelectricity, Radiant flux density, Viking lander spacecraft.

For abstract, see STAR 1121

N73-30438/8GA PC$3.00/MF$1.45
National Physical Lab., Teddington (England). Div. of Inorganic and Metallic Structure.
FILM AND VIDEO AS THE RECORDING MEDIUM IN ELECTRON MICROSCOPY.
K. F. Hale. Apr 73, 7p NPL-IMS-20

Descriptors: *Electron microscopes, *Magnetic recording, *Photographic recording, *Video equipment, High voltages, Photographic film, Television cameras.

For abstract, see STAR 1121

N73-30565/8GA PC$11.50/MF$1.45
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
CONJUGATE POINT DETERMINATION FOR MULTITEMPORAL DATA OVERLAY.
R. A. Emmert, and C. D. Mcgillem. Dec 72, 190p NASA-CR-133640, TR-EE-73-5
Contract NGL-15-005-112

Descriptors: *Data processing, *Imagery, *Remote sensors, Algorithms, Fourier transformation, Mathematical models, Templates.

For abstract, see STAR 1121

N73-31351/2GA PC$3.00/MF$1.45
Analytical Mechanics Associates, Inc., Seabrook, Md.
STATISTICAL PROCESSING OF PIONEER FRONT FILM DATA, PART 1.
Final Report.
H. Wolf. May 73, 8p NASA-CR-132797, AMA-73-24-PT-1
Contract NAS5-11978

Descriptors: *Data processing, *Photographic film, *Pioneer project, *Statistical analysis, Computer programming, Particles, Position (Location).

For abstract, see STAR 1122

N73-31410/6GA PC$3.50/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
AGFACONTOUR: A NEW FILM FOR SIMPLIFIED PRODUCTION OF EQUIDENSITIES.
E. Ranz. Sep 73, 28p NASA-TT-F-15112
Contract NASW-2481
Tran-Transl. Into English of Unpublished Dfvlr Report, Jun. 1973 21 p.

Descriptors: *Optical density, *Photographic film, Photographic emulsions, Photographic processing, Photointerpretation, Systems engineering.

For abstract, see STAR 1122

N73-31413/0GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THE APPLICATION OF HOLOGRAPHY AS A REAL-TIME THREE-DIMENSIONAL MOTION PICTURE CAMERA.
R. L. Kurtz. Sep 73, 18p NASA-TR-R-409, M-457

Descriptors: *Cameras, *Holography, *Motion pictures, *Three dimensional motion, Lasers, Mirrors, Real time operation, Sidebands.

For abstract, see STAR 1122

N73-31414/8GA PC$6.25/MF$1.45
Mead Technology Labs., Dayton, Ohio.
COMPUTER ENHANCEMENT OF RADIOGRAPHS.
Final Report.
A. Dekaney, J. Keane, and J. Desautels. 15 Jul 73, 85p NASA-CR-124393, MFR-73-3
Contract NAS8-28521

Descriptors: *Digital filters, *Imaging techniques, *Radiography, Apertures, Photographic film, Power spectra, X rays.

For abstract, see STAR 1122

N73-31426/2GA PC$3.75/MF$1.45
National Physical Lab., Teddington (England). Div. of Computer Science.
THE EXTRACTION OF CONTINUOUS BOUNDARIES AND CONTOURS FROM A RASTER SCAN.
D. A. Bell. Apr 73, 32p NPL-COM-66

Descriptors: *Algorithms, *Black and white photography, *Character recognition, *Optical data processing, *Photointerpretation, Algol, Image contrast, Imaging techniques.

For abstract, see STAR 1122

15. MILITARY SCIENCES

15C. Defense

AD-768 962/3GA PC$4.75/MF$1.45
Defense Civil Preparedness Agency Washington D C
SCENARIOS IN CIVIL PREPAREDNESS RESEARCH (A FIVE-CITY STUDY ANALYTICAL REPORT).
Final rept.,
James W. Kerr, Robert A. Harker, and Frederick C. Rockett. Jan 67, 169p

Descriptors: (*Civil defense systems, Operational readiness), Simulation, Urban areas, Management engineering, Efficiency, California, Mexico, Louisiana, Michigan, Rhode Island.
Identifiers: Scenarios.

The report traces the development and use of the five city pre-attack scenario. A copy of the local level scenario is appended. Each city session and play was analyzed, and comparisons are drawn. General conclusions and recommendations are presented, relating to CD programs, research, and to the use of scenarios as a research tool. (Author)

AD-769 081/1GA PC$4.50/MF$1.45
Stanford Research Inst Menlo Park Calif
INTRUSION-DETECTION DEVICES AND SYSTEMS FOR AIR BASE SECURITY.
Final rept. Jul 72-Mar 73,
T. Kovattana, and A. Rosengreen. Aug 73, 128p RADC-TR-73-246
Contract F30602-72-C-0531

Descriptors: (*Warning systems, *Sensors), (*Military facilities, *Passive defense), Vinyl plastics, Piezoelectric crystals, Detectors, Infrared radiation.
Identifiers: Liquid crystals, Pyroelectric detectors, Liquid crystal detectors, Perimenter defense, Polyvinyl fluoride, Signal processing, Antiinstrusion devices.

Feasibility studies of polymer films and nematic liquid crystals were conducted to assess their application in future military intrusion-detection sensors and sensor systems. Several polymer films were fabricated into pyroelectric infrared detectors, and their major characteristics were measured. MBBA nematic liquid crystals were fabricated into pressure detectors and their pertinent capabilities were assessed and compared with available detectors. In addition, a general theory of the operation of Combined Sensor detectors was developed to provide methods that can be used in the design and development of intrusion-detection systems using two complementary sensors. (Author)

15D. Intelligence

AD-768 442/6GA PC$6.25/MF$1.45
Royal Radar Establishment Malvern (England)
ON THE MINIMIZATION OF IDENTIFICATION RESIDUES.
Technical note,
W. B. Bishop, and P. L. Owen. Mar 73, 82p Rept no. RRE-TN-773 DRIC-BR-36385

Descriptors: (*Identification systems, Optimization), Target recognition, Probability, Detection, Mathematical models.
Identifiers: Identification techniques, Identification residue, IFEN(Identification Friend Enemy Neutral), Computer aided analysis, Identification friend enemy neutral.

A military identification system may be required to identify unknowns that are in fact friends, enemies, or neutrals. The analysis and design of such systems is simplified by considering separately the manner in which each type of unknown is to be identified. The unknowns that remain unknown after attempts to identify them have been made are called the identification residue. It is shown that precise definitions of the basic parts of an identification system will enable a computer to determine the relative effectiveness of different methods of identifying unknowns in various situations. In general, the identification method that produces the minimum identification residue without violating prescribed rules provides the best identification system. The manner in which identification residues can be minimized is illustrated by some arbitrarily-selected numerical examples. (Author)

AD-768 704/9GA PC$3.75/MF$1.45
Army Materiel Systems Analysis Agency Aberdeen Proving Ground Md
DEVELOPMENT OF A TERRAIN PREDICTION MODEL FOR WEST GERMANY.
Technical memo.,
Neil E. Salisbury. Jun 73, 85p Rept no. AMSAA-TM-168

Descriptors: (*Terrain intelligence, West Germany), (*Vehicles, Mobility), Terrain models, Trafficability, Site selection, Soil mechanics, Hydrology, Statistical data.

The report describes in detail the efforts conducted to develop a terrain prediction model for examining vehicle mobility in West Germany. The analyses conducted to develop the model and the results obtained when applying the model to areas of West Germany with known terrain characteristics are discussed in detail. Conclusions are presented about the quality and representativeness of the US Army Engineer Waterways Experiment Station terrain data, the efficacy of the developed model and recommendations as to future efforts in terrain analysis. (Author)

15E. Logistics

AD-768 731/2GA PC$3.75/MF$1.45
Navy Fleet Material Support Office Mechanicsburg Pa Operations Analysis Dept
APPLICATION OF THE PENALTY COST MODEL TO CENTRALLY MANAGED ITEMS,
G. S. Crum. 17 Oct 73, 35p Rept no. 102

Descriptors: (*Naval equipment, *Inventory control), Costs, Mathematical models, Naval procurement, Sensitivity, Decision theory.
Identifiers: Computerized simulation.

The report compares and evaluates the current UICP (Uniform Inventory Control Point) physical

inventory selection method with PCM (Penalty Cost Model). The report also evaluates the sensitivity of parameter changes in the UICP physical inventory program. Analysis of ICP inventories demonstrated that the number of inventories can be drastically reduced without adversely affecting requisition effectiveness while also increasing the net worth of taking the inventory. Thus, inventorying resources are used in a more cost effective manner. (Modified author abstract)

AD-768 732/0GA PC$4.50/MF$1.45
Navy Fleet Material Support Office Mechanicsburg Pa Operations Analysis Dept
EVALUATION OF PHYSICAL INVENTORY PERFORMANCE INDICES.
22 Oct 73, 46p Rept no. 103

Descriptors: (*Inventory control, Naval equipment), Management planning, Costs, Errors, Graphics, Mathematical models, Efficiency.
Identifiers: Naval air facilities, Computerized simulation.

A physical inventory model, the PCM (Penalty Cost Model) was designed to react to the economic implications of record errors and to assign resources accordingly. Thus, PCM is not concerned with record errors per se, but the economic implications of record errors. As continuing research in physical inventory, NAVSUP (Naval Supply Systems Command) directed FMSO (Fleet Material Support Office) to develop a performance index of record accuracy. This index would measure the success of physical inventory programs and permit comparisons of Navy activities. The report evaluates three indices that were tested at NAS Oceana. It also evaluates the desirability of computing the index values at various time intervals--weekly, monthly, or quarterly. Of the indices considered, the best comparison between activities is based on the relationship of the requisition frequency for an item and the dollar value of errors. (Author)

AD-768 787/4GA PC$2.75/MF$1.45
Army Electronics Command Fort Monmouth N J
GUIDELINES FOR DESIGN TO UNIT PRODUCTION COST (DTUPC).
Technical rept.,
Clifton T. Trigg. Oct 73, 19p Rept no. ECOM-4162

Descriptors: (*Army procurement, Military requirements), Design, Costs, Production.
Identifiers: Design to cost analysis.

The introduction of DOD Directive 5000.1, AR 1000-1 and the new material acquisition guidelines has been followed by numerous directives, policy statements, and similar papers that philosophically address the issue of Design to Unit Production Cost (DTUPC). The guidance on DTUPC has been evolutionary in character, and therefore, the report represents a synopsis of the more salient points of DTUPC implementation. As such it describes the DTUPC, explores the criteria of when it should be applied, suggests methods for development of the DTUPC, and provides guidance for the establishment of tracking procedures. The report is of an abstract nature, to be used as a ready reference. It is not meant to be definitive to the point of addressing the DTUPC, as would be the case in a handbook or procedural document. As the DTUPC philosophy continues to evolve and experience is gained, more detailed procedural documents will be published. (Author)

AD-768 803/9GA PC$4.00/MF$1.45
Florida Univ Gainesville
A RESEARCH PROGRAM IN OPTIMIZATION AND LOGISTICS SYSTEMS AND INFORMATION STORAGE AND RETRIEVAL.
Final rept. 19 Jun 70-18 Jun 73,
Robert Braswell. 18 Jun 73, 40p AROD-9522:3-RT
Grant DA-ARO-D-31-124-70-G92

Descriptors: (*Logistics, *Army research), Inventory control, Replacement theory, Mathematical programming, Pattern recognition, Information retrieval, Abstracts, Indexes, Scheduling, Mathematical models, Optimization.
Identifiers: Resource allocation, Network flows.

Research was conducted on the following topics: mathematical theory of inventory; mathematical models of the U.S. Army physical distribution system; replacement theory; mathematical programming; facilities design and warehousing; and resource allocation and scheduling in networks. Research on information storage and retrieval included recognition of full text input, automatic abstracting, automatic indexing, automatic clustering and classification, automatic picture reading, automatic map analysis, automatic voice recognition, and data filing and storing. The report consists primarily of publications and personnel listing and brief summaries of certain research topics. (Author)

AD-768 826/0GA MF$1.45
Ketron Inc Wayne Pa
THE CHANGE PROCESS IN WEAPONS SYSTEM ACQUISITION.
Final rept.,
William J. Douglas. 3 Aug 73, 93p Rept no. KTR-703-2
Contract DAHC15-73-C-0200
Availability: Available in microfiche only. x

Descriptors: (*Government procurement, Weapon systems), Costs, Configuration, Military requirements, Graphics, Design, Management planning.
Identifiers: *Benefit cost analysis, Logistics management.

The change process in weapons system is evaluated with regard to cost growth, time, and change volume. Configuration management procedures are reviewed and the volume of ECP's is related to some specific weapons systems and military agencies. The causes of change are examined and recommendations are made for improving the process. (Author)

N73-30464/4GA PC$3.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge.
SOME PROBLEMS AND PROSPECTS FOR MARINE TRANSPORTATION OF OIL IN THE 1970S.
Z. S. Zannetos. Mar 73, 21p NASA-CR-133854, REPT-649-73
Contract NGL-22-009-309
Conf-Presented at the Energy: Demand, Conserv. And Institutional Probl. Conf., Cambridge, Mass., 12-14 Feb. 1973.

Descriptors: *Crude oil, *Tanker ships, Cost analysis, Cost estimates, Earth resources.

For abstract, see STAR 1121

15G. Operations, Strategy, and Tactics

AD-768 961/5GA PC$7.50/MF$1.45
Stanford Research Inst Menlo Park Calif
CDEC INSTRUMENTATION STUDY -- PHASE I,
J. H. Jones, R. C. Amara, R. M. Madvig, E. A. Elpel, and W. M. Lynch. Dec 59, 108p
Contract DA-04-351-AVI-1731

Descriptors: (*War games, *Instrumentation), Warfare, Simulation, Systems engineering, Data processing systems, Programming(Computers).

The Combat Development Experimentation Center has as its over-all objective the testing and evaluation of combat equipments techniques, and evaluation organizational configurations. One of the principal testing methods is field experimentation involving actual troops and vehicles, with simulated fire and weapons effects. Instrumentation for this type of experiment is the subject of this study. A hypothesized system and set of techniques were used as a test case to show what parameters are significant, and to show the relationship of these parameters to actual equipment. Results are discussed.

AD-768 984/7GA PC$3.50/MF$1.45
Stanford Research Inst Menlo Park Calif
SURVEY OF DIGITAL DATA TECHNIQUES FOR CDEC.
Special rept. no. 2,
E. A. Elpel. Apr 60, 28p
Contract DA-04-351-AVI-1731

Descriptors: (*War games, *Data transmission systems), Digital systems, Data processing systems, Automation.

The report is concerned with the communication system necessary to implement an all-automatic system. The all-automatic system is a system in which data is entered by a field umpire and/or by field transducers, transmitted over a radio link, and processed. Logical choices are made from the data and appropriate field umpires are notified of any new status as a result of the data. The system would also record data for future analysis and keep an up-dated display of the field conditions. The digital data portion of the all-automatic system is a sub-system which provides the two-way link between the field umpire (and/or field transducers) and the data processing equipment at the control center.

16. MISSILE TECHNOLOGY

16B. Missile Trajectories

AD-768 773/4GA PC$3.00/MF$1.45
Army Missile Command Redstone Arsenal Ala Aeroballistics Directorate
DESCRIPTION OF POINT MASS AND THREE DEGREE OF FREEDOM TRAJECTORY PROGRAMS.
Technical rept.,
James R. Burt, Jr., and Mickie P. Stamps. 18 Sep 73, 30p Rept no. RD-TR-73-31

Descriptors: (*Guided missile trajectories, *Computer programs), (*Rocket trajectories, Computer programs), Equations of motion, Drag, Thrust, Digital computers.
Identifiers: BASIC programming language, HP 9830 computers, Degrees of freedom, Three degrees of freedom, Two degrees of freedom.

The report describes two Basic language programs written for the Hewlett Packard Model 9830 digital computer. The first program described computes a 2-degree of freedom or point mass trajectory for a rocket which may have a boost, sustain, and coast phase. The second program has 3 degrees of freedom: range, altitude, and pitch angle. A flat earth is assumed and atmospheric properties vary with altitude. Two constant thrust levels and up to three drag tables may be used. The output data may be tabulated and/or plotted on the HP 9802A calculator plotter. A Basic listing of the programs and sample outputs are included in the report. (Author)

16D. Missiles

AD-768 770/8GA PC$3.75/MF$1.45
Army Missile Command Redstone Arsenal Ala Ground Equipment and Materials Directorate
ANALYSIS AND DESIGN OF THERMALLY AND MECHANICALLY PRESTRESSED FLAT PLATES SUBJECTED TO TRANSVERSE BLAST LOADS.
Technical rept.,

T. L. Cost, J. R. Griffin, and R. H. Pettey. May 73, 76p Rept no. RL-TR-72-18

Descriptors: (*Guided missiles(Surface-to-air), Loading(Mechanics)), (*Nuclear explosions, Blast), Airburst, Detonation waves, Stresses, Buckling(Mechanics), Thermal analysis, Antimissile defense systems, Mathematical models, Computer programs.
Identifiers: Plates(Structural members), QTR-PLATE computer code.

The computer code described in this report has proven to be accurate, fast, and easy to use in the analysis and design of prestressed flat plates subjected to air-blast loads, such as those caused by nuclear explosions. Studies of parameter inclucnces can be easily carried out. The influence of loading parameters can also be evaluated. The computer code does have the limitation of linear elastic material behavior. This limitation should be overcome by extension of the method to include elastic-plastic and viscoelastic material behavior. Results of the parameter study indicate that mechanical and thermal prestresses can significantly influence the dynamic response of structures.

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-768 369/1GA PC$3.75/MF$1.45
Cambridge Acoustical Associates Inc Mass
INVERSE SCATTERING FROM A SPHERE.
Technical rept.,
David A. Sachs. Jul 73, 31p Rept no. CAA-U-414-210
Contract N00014-69-C-0096

Descriptors: (*Sonar targets, Backscattering), Sound transmission, Spheres, Differential equations, Geometry, Graphics.
Identifiers: *Geometrical acoustics, Inverse scattering.

An inverse scattering method based on geometric acoustics is described and its accuracy investigated numerically as a function of frequency and range for the case of a rigid sphere. (Author)

AD-768 398/0GA PC$4.25/MF$1.45
TRW Systems Group Redondo Beach Calif Space Vehicles Div
FEASIBILITY DEMONSTRATION OF LOW FREQUENCY ACOUSTO-OPTICAL IMAGING FOR SONAR APPLICATIONS.
Interim rept. Jan 72-Jun 73 on phase 1,
R. A. Smith, J. H. Cole, R. L. Johnson, and P. G. Bhuta. 12 Jul 73, 109p Rept no. TRW-AT-SVD-TR-73-10
Contract N00014-72-C-0182, ARPA Order-1959

Descriptors: (*Sonar signals, Optical images), (*Sonar arrays, Feasibility studies), Design, Target recognition, Resolution, Low frequency, Television display systems, Photographic recording systems.
Identifiers: Acoustooptical imaging systems, Acoustooptic interactions.

Analysis and experiments were performed to prove the feasibility of an underwater imaging system based on acousto-optical imaging for sonar applications at frequencies from 25 to a few hundred KHz. Experimental results confirming sensitivity and resolution are presented together with images of insonified objects at a distance of 15 feet (the maximum allowed by the size of the test facility). A novel heterodyning technique was devised to perform low frequency imaging. Based upon the laboratory experiments, range and resolution achievable with the acousto-optical imaging sonar are estimated. Construction of a high resolution acousto-optical imaging sonar is entirely feasible. (Author)

AD-768 859/1GA PC$2.75/MF$1.45
Texas Univ Austin Applied Research Labs
PORTABLE BEACON,
Wiley S. Olsen. 21 Aug 73, 18p Rept no. ARL-TM-73-24
Contract N60921-73-C-0107

Descriptors: (*Sonar beacons, Portable), Navigational aids, Submarines, Instruction manuals.
Identifiers: Captor project.

The portable beacon system is part of an acoustic precision navigation system used by submarines during data recording operations. The portable beacon system consists of two beacons and batteries and a control unit. The control unit includes battery chargers and provides an interface connection to synchronize and test the beacons while out of the water. The report is intended as an operating and instruction manual for the system. (Author)

AD-768 860/9GA PC$2.75/MF$1.45
Texas Univ Austin Applied Research Labs
SUBMARINE POWERED, SUBMARINE TRACKING PINGER,
Wiley S. Olsen. 21 Aug 73, 18p Rept no. ARL-TM-73-25
Contract N60921-73-C-0107

Descriptors: (*Sonar projectors, Submarines), Tracking, Synchronization(Electronics).
Identifiers: Captor project.

The submarine powered, submarine tracking pinger (SP-STP) is designed to mount on submarines to allow the submarine to be accurately tracked by a sonar system. The SP-STP is synchronized to a master clock and produces a pulse every 10 sec (or 5 sec if desired). There are two SP-STP units, which differ only in the precision of each of the 1 MHz oscillators. Unit one has an accuracy of 1 part in 10 to the minus 9th power and is the primary unit, and Unit two has an accuracy of 1 part in 10 to the minus 8th power and is the backup unit. (Author)

17B. Communication

AD-768 844/3GA PC$4.50/MF$1.45
Federal Aviation Administration Washington D C Systems Research and Development Service
TANDEM ELECTRONIC VOICE SWITCHING (EVS) SYSTEM.
Project plan,
John F. Schroeder. 1 Jun 73, 144p* Rept no. FAA-RD-73-133

Descriptors: (*Communication systems, *Switching circuits), (*Air traffic control systems, Communication systems), Integrated systems, Voice communication systems, Automation, Systems engineering.
Identifiers: Air route traffic control centers.

The Tandem Electronic Voice Switching (EVS) System Project Plan identifies responsibilities and describes events and activities which must be completed in order to integrate the Tandem EVS System with NAS En Route Stage A. Initial emphasis is on the installation and evaluation testing of a preproduction EVS System at NAFEC for which the System Research and Development Service has primary responsibility; however, the plan also addresses the implementation of production systems and provides for the transition of primary responsibility to the Airway Facilities Service for this activity. The Tandem EVS System Project Plan does not assign responsibilities, but rather amalgamates and synchronizes, the planning of participating organizations with respect to their inherent responsibilities for the Tandem EVS Project. (Author)

AD-768 862/5GA PC$3.00/MF$1.45
Texas Univ Austin Applied Research Labs
MULTIPLEXER-DEMULTIPLEXER SYSTEM,
Wiley S. Olsen. 30 Aug 73, 33p* Rept no. ARL-TM-73-27
Contract N60921-73-C-0107

Descriptors: (*Communication equipment, *Multiplex), Magnetic recording systems, Data transmission systems, Sonar signals, Underwater sound, Data processing systems.
Identifiers: *Multiplexers, Signal processing, Captor project.

The multiplexer-demultiplexer system was designed to allow six different signals to be recorded on a single channel of a magnetic tape recorder and to be recovered in their original form upon playback. The system is composed of two basic units: the multiplexer and the demultiplexer. The multiplexer is described first to show what signals are recorded and how the unit operates. The description of the demultiplexer unit follows with a description of the means by which the signal are separated. Schematic diagrams are included for each of the units. (Author)

AD-768 899/7GA PC$3.50/MF$1.45
Philco-Ford Corp Willow Grove Pa Communication Systems Div
CIRCUIT QUALITY MONITOR.
Final rept. 28 May 71-23 Jul 73,
William Foerster, and Donald R. Pandori. Aug 73, 59p ECOM-0271-3
Contract DAAB07-71-C-0271

Descriptors: (*Communication systems, Monitors), Multiplex, Automatic, Classification, Circuits, Voice communication systems, Data transmission systems.

The objective of the program was to establish the feasibility of automatically classifying high usage links as to their relative suitability. (Author)

AD-768 914/4GA PC$4.50/MF$1.45
ITT Electro-Physics Labs Inc Columbia Md
TEAL WING OWR PROGRAM, SEMI-ANNUAL TECHNICAL REPORT FOR PERIOD ENDING 30 SEPTEMBER 1973.
Project rept.,
Robert B. Wagner. Oct 73, 47p Rept no. ITT-EPL-241
Contract N00014-72-C-0441, ARPA Order-2073
See also report dated 1 Apr 73, AD-759 033.

Descriptors: (*Radio interference, Atlantic Ocean), Noise, Radiofrequency interference, Measurement, Electronic equipment, Ionospheric propagation, Signal-to-noise ratio.
Identifiers: TEAL WING OWR program, North Atlantic Ocean.

Progress to date consists of the following: two of the three seasonal measurements of at-sea natural noise were made and partially analyzed; the suitability of existing, fleet-deployed antennas for the intended class of service was investigated; and, the channel characterization experiments, performed during August 1973 between Cape Cod and two points on the coast of Maine (100 and 220 nm) are described under the following categories: equipment, physical set-up, and some preliminary data results which indicate that dispersion is insignificant on the surface-wave mode for the environmental conditions prevailing during the test period.

AD-768 977/1GA PC$3.00/MF$1.45
Syracuse Univ N Y Dept of Electrical and Computer Engineering
GROUND-TO-AIR COMMUNICATION PERFORMANCE MONITOR.
Technical rept.,
Jose Perini, and Dale Parfitt. Aug 73, 32p RADC-TR-73-252
Contract F30602-72-C-0360

Descriptors: (*Radio equipment, *Monitors), Airport control towers, Air traffic control systems, Transmitter-receivers, Surface-to-air, Radio communication systems, Distortion.

The Air Force Communications Service (AFCS) has expressed a need for a ground-to-air performance monitor to be used in conjunction with their control tower communications system. The monitor is to be installed in the transmitter-receiver communications link and should provide a quick and simple means of determining the status of the system. The report is concerned with the design and development of such a monitor to be used at Richards-Gebaur Air Force Base, Kansas City, Missouri. (Author)

COM-73-11848/1GA PC$3.00/MF$1.45
Office of Telecommunications, Washington, D.C.
THE REAL COST OF BASIC TELEPHONE SERVICE TO THE AVERAGE WORKER IN FIFTEEN DEVELOPED COUNTRIES,
Marianne Karydes. Aug 73, 44p OTR-73-17

Descriptors: (*Telephone systems, *Consumers), (*Services, *Cost analysis), Economic surveys, Rates(Costs), Fees, Reviews, Availability, Time, Earnings, Foreign countries, United States, Telecommunication.
Identifiers: Industrial workers.

The paper addresses the question of what it actually costs the average worker to buy his basic telephone service. Fifteen developed countries are surveyed. The most recent information available on the extent of telephone development in each, the number of telephones per 1000 population, is presented, along with the cost in the number of working hours required to purchase basic service, 1960-71 in each of the countries surveyed. In four separate tables the different categories of telephone charges are given for each year and each country during this time period. Each table is followed by a brief discussion.

N73-30479/2GA PC$6.25/MF$1.45
Technische Hochschule, Vienna (Austria). Inst. fuer Hochfrequenztechnik.
DATA TRANSMISSION WITH THE HELP OF LASERS DATENUEBERTRAGUNG MIT HILFE VON LASERN.
31 Dec 72, 83p
Language in German.

Descriptors: *Carbon dioxide lasers, *Data transmission, *Laser materials, *Laser outputs, Optical communication, Performance tests, Test equipment.

For abstract, see STAR 1121

N73-30834/8GA PC$26.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NASA COMPENDIUM OF SATELLITE COMMUNICATIONS PROGRAMS.
Jun 73, 482p NASA-TM-X-70435, X-751-73-178
Contract NAS5-21522
Subm-Prepared in Cooperation with Computer Sciences Corp.

Descriptors: *Echo project, *Spacecraft communication, *Telstar project, Nasa programs, Satellite communications ships, West ford project.

For abstract, see STAR 1121

N73-31098/9GA PC$3.50/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
ERROR RATE MEASURING EQUIPMENT OF A 640 MBITS/S PCM SIMULATOR.
T. Adachi. Jul 72, 30p FTZ-A-442-TBR-38

Descriptors: *Beam waveguides, *Errors, *Pseudorandom sequences, *Pulse code modulation, *Pulse generators, Bit synchronization, Counting circuits, Measuring instruments, Shift registers, Simulators.

For abstract, see STAR 1122

N73-31099/7GA PC$3.50/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
OBSERVATIONS OF A 210 KM LONG 12 GHZ LINK BEOBACHTUNGEN AN EINER 210 KM LANGEN 12-GHZ-STRECKE.
N. Abel. Jan 72, 29p FTZ-A-455-TBR-34
In German; English Summary.

Descriptors: *Radio relay systems, *Signal reception, *Transhorizon radio propagation, *Transmission loss, Long term effects, Precipitation (Meteorology), Scatter propagation, Superhigh frequencies, Wave reflection.

For abstract, see STAR 1122

N73-31101/1GA PC$3.00/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
DEPOLARIZATION MEASUREMENTS IN THE TELECASTING AND BROADCASTING REGION IV/V DEPOLARISATIONSMESSUNGEN IM FERNSEH-RUNDFUNKBEREICH IV/V.
L. Fehlhaber, and H. Homuth. Apr 72, 20p FTZ-A-455-TBR-36
In German; English Summary.

Descriptors: *Broadcasting, *Depolarization, *Television transmission, Antenna radiation patterns, Decoupling, Frequency assignment, Polarized electromagnetic radiation, Troposphere, Wave propagation.

For abstract, see STAR 1122

N73-31102/9GA PC$3.00/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
TEST SETUP OF A TV TRANSMISSION SYSTEM WITH VESTIGEAL SIDEBAND AMPLITUDE FREQUENCY MODULATION VERSUCHSAUFBAU EINES TV-UEBERTRAGUNSSYSTEMS MIT RESTSEITENBANDAMPLITUDEN-FREQUENZMODULATION (RM/FM).
B. Staudemeyer. Jan 72, 10p FTZ-44-TBR-33
Language in German.

Descriptors: *Amplitude modulation, *Broadcasting, *Frequency modulation, *Television transmission, Sidebands, Superhigh frequencies, Television receivers, Transmitters.

For abstract, see STAR 1122

N73-31104/5GA PC$3.00/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
METHODS FOR RECOGNITION OF SPEECH SIGNALS IN MARINE COMMUNICATIONVERFAHREN ZUR ERKENNUNG VON SPRACHSIGNALEN IM SEEFUNKVERKEHR.
H. Krause. 1972, 13p FTZ-416-TBR-5
Language in German.

Descriptors: *Radio communication, *Ships, *Speech recognition, Feedback circuits, Loudness, Signal detectors, Signal to noise ratios.

For abstract, see STAR 1122

N73-31107/8GA PC$3.00/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
PROVISIONAL ESTIMATION OF THE USABILITY OF 42 AND 85 GHZ MILLIMETER WAVES IN TERRESTRIAL COMMUNICATIONS DIE VORLAEUFIGE BEURTEILUNG DER EIGNUNG VON MM-WELLEN BEI 42 UND 85 GHZ FUER TERRESTRISCHE NACHRICHTENVERBINDUNGEN.
J. Feldmann, and K. Sakowski. Mar 72, 14p FTZ-455-TBR-37
Language in German.

Descriptors: *Broadcasting, *Extremely high frequencies, *Television transmission, Atmospheric attenuation, Cities, Maximum usable frequency, Millimeter waves, Wave propagation.

For abstract, see STAR 1122

N73-31108/6GA PC$3.50/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
UTILIZATION OF ORTHOGONAL CARRIER MODULATION FOR TELEGRAPHY TRANSMISSION NUTZUNG ORTHOGONALER TRAEGERMODULATION ZUR TELEGRAFIEUEBERTRAGUNG (ZWISCHENBERICHT).
Interim Report.
A. Corbet. Oct 72, 29p FTZ-455-TBR-39
Language in German.

Descriptors: *Carrier waves, *Noise tolerance, *Radio communication, *Telegraph systems, Amplitude modulation, Bit synchronization, Broadcasting, Long wave radiation, Orthogonal functions, Phase lock demodulators, Signal to noise ratios.

For abstract, see STAR 1122

N73-31112/8GA PC$4.25/MF$1.45
National Physical Lab., Teddington (England). Div. of Computer Science.
SIMULATION OF A PACKET-SWITCHED DATA NETWORK OPERATING WITH A REVISED LINK AND NODE PROTOCOL.
W. L. Price. Apr 73, 44p NPL-COM-68

Descriptors: *Computerized simulation, *Data links, *Data transmission, *Network analysis, Flow charts, Priorities, Queueing theory, Routes, Transmission efficiency, Wave packets.

For abstract, see STAR 1122

N73-31402/3GA PC$3.75/MF$1.45
Australian Post Office Research Labs., Melbourne.
AUTOMATIC SPEECH LEVEL METER.
G. T. Martin. Sep 72, 31p REPT-6648

Descriptors: *Circuits, *Recording instruments, *Speech recognition, Audio frequencies, Computer programs, Voltmeters.

For abstract, see STAR 1122

N73-31469/2GA PC$26.75/MF$1.45
Aerojet-General Corp., Azusa, Calif.
LASER COMMUNICATION EXPERIMENT. VOLUME 1: DESIGN STUDY REPORT: SPACECRAFT TRANSCEIVER. PART 1: TRANSCEIVER DESIGN.
Jul 70, 492p NASA-CR-132803, REPT-4033-VOL-1-PT-1
Contract NAS5-21072

Descriptors: *Ats 6, *Carbon dioxide lasers, *Optical communication, *Space communication, Communication equipment, Systems analysis, Transmitter receivers.

For abstract, see STAR 1122

N73-31470/0GA PC$17.75/MF$1.45
Aerojet-General Corp., Azusa, Calif.
LASER COMMUNICATION EXPERIMENT. VOLUME 1: DESIGN STUDY REPORT: SPACECRAFT TRANSCEIVER. PART 2: APPENDICES.
Jul 70, 311p NASA-CR-132804, REPT-4033-VOL-1-PT-2-APP
Contract NAS5-21072

Descriptors: *Ats 6, *Carbon dioxide lasers, *Optical communication, *Space communication, Data acquisition, Data processing, Ground support equipment, Systems analysis.

For abstract, see STAR 1122

N73-31471/8GA PC$16.00/MF$1.45
Aerojet-General Corp., Azusa, Calif.
LASER COMMUNICATION EXPERIMENT. VOLUME 1: DESIGN STUDY REPORT: SPACECRAFT TRANSCEIVER. PART 3: LCE DESIGN SPECIFICATIONS.
Jul 70, 277p NASA-CR-132805, REPT-4033-VOL-1-PT-3
Contract NAS5-21072

Descriptors: *Ats 6, *Carbon dioxide lasers, *Optical communication, *Signal reception, *Space communication, Electronic equipment, Environmental tests, Equipment specifications, Product development, Systems analysis.

For abstract, see STAR 1122

N73-31477/5GA PC$3.25/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
OPTICAL TELECOMMUNICATION WITH LASERS OPTISCHE NACHRICHTENUEBERTRAGUNG MIT LASER.
K. Juergensen. Jan 72, 25p FTZ-A-465-TBR-8
Conf-Lecture Held at the Elektrotech. Ver., Darmstadt, West Ger., 19 Jan. 1971.
Language in German.

Descriptors: *Atmospheric optics, *Fiber optics, *Lasers, *Optical communication, Free atmosphere, Laser materials, Lenses, Modulation.

For abstract, see STAR 1122

N73-31478/3GA PC$3.50/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
DIGITAL TRANSMISSION TESTS USING LASER BEAM THROUGH THE ATMOSPHERE TO DETERMINE THE OCCURRING ERROR FREQUENCY DIGITALE UEBERTRAGUNGSVERSUCHE MITTELS LASERSTRAHL DURCH DIE ATMOSPHAERE ZUR FESTSTELLUNG DER AUFTRETENDEN REHLERHAEUFIGKEIT.
G. Herchenroeder. Feb 73, 28p FTZ-44-TBR-34
Language in German.

Descriptors: *Argon lasers, *Data transmission, *Error signals, *Optical communication, Atmospheric optics, Digital data, Pulse code modulation, Weather.

For abstract, see STAR 1122

PAT-APPL-307714/GA PC$3.00/MF$1.45
North American Rockwell Corp., Downey, Calif.
AIRCRAFT-MOUNTED CRASH-ACTIVATED RADIO DEVICE.
Patent Application.
R. Manoli, and B. R. Ulrich. Filed 17 Nov 72, 13p
NASA-CASE-MFS-16609-2,
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Aircraft accidents, *Position indicators, *Radio transmitters, *Signal transmission, Aircraft instruments, Patent applications.

A description is given of an aircraft crash location transmitter device. The device is mounted on the tail of an aircraft in a round sealed case held by a shear pin that releases under crash impact of 7 to 8 G's. The transmitter is powered by a batter which is kept charged by a trickel charge from the aircraft electrical system, preferably the wiring leading to the navigational light on the tail. The transmitter has a button actuated meter to test the transmitter battery condition while the apparatus is installed on an aircraft. At the time of the crash, the transmitter is released and ejected, the concave-formed metal spring blade antenna wound around the case unwinds and the transmitter starts emitting on emergency frequencies 121.5 MHz and 243 MHz. The transmitter, which is shock mounted within outer and inner cases, lands and continues transmitting for about 48 hours.

PATENT-3 749 831/GA Not available NTIS
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
TELEVISION MULTIPLEXING SYSTEM.
Patent.
L. G. Simpkins. Patented 31 Jul 73, 7p NASA-CASE-KSC-10654-1,
Misc-Filed 5 May 1972 Supersedes N72-25184 (10 - 16, p 2122).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Multiplexing, *Signal transmission, *Television equipment, Patents, Signal processing, Synchronism.

A television multiplexing system which includes a circuit that inserts a digital codes sync signal and a digital code into a video signal for identifying the channel is described. The digital sync signal and the digital coded signals are generated by a single crystal controlled clock so that they are always in synchronism with each other. In demultiplexing the signals are utilized for shifting the digital coded signals into a shift register. The shift register, in turn, activates a decoder according to the code stored in the shift register for selecting the proper recording disk or receiver for storing the video signal.

PB-224 145/3GA PC$7.75/MF$1.45
Community Information Systems, Inc., Chaska, Minn.
THE JONATHAN/CHASKA COMMUNITY INFORMATION SYSTEM EXPERIMENTS.
Final rept.
Jun 73, 375p*
Contract HUD-H-1653

Descriptors: (*Closed circuit television, *Minnesota), (*Telecommunication, *Research projects), Communication cables, Community relations, Urban areas, Surveys, Public opinion, Broadband, Information systems, Microwave equipment, Urban planning, Communications management.
Identifiers: *Cable television, Jonathan(Minnesota), CATV(Community Antenna Television), Chaska(Minnesota), Two way communication systems.

A project carried out in the town of Jonathan, Minnesota, was the assessment of demand for various services which could be delivered to homes via broad band communications networks. A prototype community information and services center was constructed and operated where area residents and visitors would gain 'hands-on' experience with the equipment required for home delivery and could sample a variety of services which could potentially be made available. An in-depth survey was later conducted to determine peoples' willingness to pay for home delivery of services.

PB-224 278/2GA PC$3.00/MF$1.45
RAND Corp., Santa Monica, Calif.
CABLE TELEVISION: CITIZEN PARTICIPATION IN PLANNING,
Robert K. Yin. Mar 73, 36p* R-1136-NSF NSF-RA/S-73-008
Grant NSF-GI-32107

Descriptors: (*Closed circuit television, Communications management), Management planning, Community relations, Decision making, Local government.
Identifiers: *Cable television, CATV(Community Antenna Television).

The report describes some of the community-related issues that can be most productively debated among the citizens of any community, as well as some of the forms that citizen participation can take. Each community must decide for itself the degree of citizen participation, based on its own unique situation. Should participation be deemed appropriate, issues for deliberation might include: Ownership, Cable System Geography, Cable Subscription Fees, Cable Service, and Monitoring Cable Operations. The report points out the general pros and cons of each issue, and offers tentative guidelines for structuring citizen and official deliberation.

PB-224 279/0GA PC$3.75/MF$1.45
RAND Corp., Santa Monica, Calif.
CABLE TELEVISION: THE PROCESS OF FRANCHISING,
Leland L. Johnson, and Michael Botein. Mar 73, 95p* R-1135-NSF NSF-RA/S-73-007
Grant NSF-GI-32107

Descriptors: (*Closed circuit television, Communications management), Contracts, Decision making, Local government.
Identifiers: *Cable television, CATV(Community Antenna Television), Franchises.

The report is to assist local governments and citizens groups in working through the various stages of the franchising process, in terms of both the mechanics and the policy issues involved in writing and awarding a well-conceived franchise. The focus throughout is on those jurisdictions that have yet to go through the franchising process. The various steps of the process are described and concentration on the many major and minor provisions that a franchise should include are noted.

PB-224 285/7GA PC$3.50/MF$1.45
RAND Corp., Santa Monica, Calif.
CABLE TELEVISION: USES IN EDUCATION,
Polly Carpenter. May 73, 69p* R-1143-NSF NSF-RA/S-73-065
NSF-GI-32107

Descriptors: (*Closed circuit television, *Education), Utilization, Communications management.
Identifiers: *Cable television, CATV(Community Antenna Television).

The report is the first of a two-volume study on cable television in education. The report discusses the past history of television in education and the special ways in which cable TV can serve the education communication. The report is directed to the reader with a general interest in the subject.

PB-224 286/5GA PC$3.75/MF$1.45
RAND Corp., Santa Monica, Calif.
CABLE TELEVISION: A GUIDE FOR EDUCATION PLANNERS,
Polly Carpenter. May 73, 99p* R-1144-NSF NSF-RA/S-73-016
Grant NSF-GI-32107

Descriptors: (*Closed circuit television, *Education), Utilization, Management planning, Communications management.
Identifiers: Cable television, CATV(Community Antenna Television).

The Guide is part two of a two-volume study on the use of cable television in education. It is for the education planner who may be charged with planning, developing, and operating an education project using cable TV. Two areas discussed in detail - the acquisition of suitable programming and the integration of the programming into the rest of the school's activities. The 'dos' and 'don'ts' are based on experiences of schools and other education institutions with television, the recommendations of leading groups in education or both and RAND's backgrounds in planning, management, and evaluation of education projects and in communication technology and policy.

PB-224 559/5GA PC$5.75/MF$1.45
Forecasting International Ltd., Arlington, Va.
AN ANALYSIS AND REPORT ON THE TECHNOLOGY ASSESSMENT OF URBAN TELECOMMUNICATIONS RESEARCH.
Final rept.,
Marvin J. Cetron, Sandra J. Brown, George Foster, Kathleen Hudak, and Kathryn H. Humes. Aug 73, 229p*
Contract HUD-H-2024R

Descriptors: (*Telecommunication, Urban areas), Urban development, Urban planning, Forecasting, Assessments.

The report assesses the potential impacts of telecommunications technology on U.S. cities over the period 1973-1985. The impacts with which the study is concerned include: (1) effects on the method of operation of urban business and commerce, (2) effects on the employment of urban residents and commuters, (3) effects on the capacity of city governments to pay for and provide services, (4) effects on the style of life of central city residents, and (5) overall impacts on the cities, particularly in the context of the economic and social crisis with which cities will be struggling during this period.

SLA-73-5529/GA PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
COMMAND GRAPHS.
G. J. Simmons. 1972, 47p CONF-730636-1

Descriptors: (*Communications, *Diagrams), Algorithms, Geometry, Information theory, Mathematics.

For abstract, see NSA 28 08, number 20587.

17E. Infrared and Ultraviolet Detection

PATENT-3 749 911/GA Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
COLLIMATOR OF MULTIPLE PLATES WITH AXIALLY ALIGNED IDENTICAL RANDOM ARRAYS OF APERTURES.
Patent.
R. B. Hoover, and J. H. Underwood. Patented 31 Jul 73, 6p NASA-CASE-MFS-20546-2,
Misc-Filed 30 Jun. 1970 Supersedes N70-35586(08 - 19, p 3540). Subm-Continuation-in-Part of Abandoned US Patent Appl. Sn-11220, Filed 13 Feb. 1970.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Collimators, *Far infrared radiation, *Near infrared radiation, *Position (Location), Angular distribution, Patents, Spatial distribution.

A collimator is disclosed for examining the spatial location of distant sources of radiation and for imaging by projection, small, near sources of radiation. The collimator consists of a plurality of plates, all of which are pierced with an identical random array of apertures. The plates are mounted perpendicular to a common axis, with like apertures on consecutive plates axially aligned so as to form radiation channels parallel to the common axis. For near sources, the collimator is interposed between the source and a radiation detector and is translated perpendicular to the common axis so as to project radiation traveling parallel to the common axis incident to the detector. For far sources the collimator is scanned by rotating it in elevation and azimuth with a detector to determine the angular distribution of the radiation from the source.

PATENT-3 761 713/GA Not available NTIS
Department of the Interior, Washington, D.C.
METHOD OF DETECTING LOOSE ROCK.
Patent,
Robert H. Merrill. Filed 13 Jul 71, patented 25 Sep 73, 4p PAT-APPL-162 065, DOCKET/MIN-1766
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Infrared scanners, *Patents), (*Underground surveys, *Rock properties), Temperature measuring instruments, Rock mechanics, Voids, Identification systems, Tunneling(Excavation), Remote sensing.
Identifiers: PAT-CL-250-341.

The patent relates to a method of detecting loose rock in excavated passages through subterranean structures by an analysis of thermal conditions at the surfaces of said passages measured with infrared responsive instruments.

17G. Navigation and Guidance

AD-768 560/5GA PC$3.50/MF$1.45
Stanford Univ Calif Guidance and Control Lab
ADVANCE RESEARCH IN GUIDANCE, CONTROL, AND INSTRUMENTATION.
Final rept.,
Daniel B. DeBra, Arthur E. Bryson, Jr., and J. David Powell. Sep 73, 64p AFAL-TR-73-288
Contract F33615-72-C-1297

Descriptors: (*Jet planes, Navigational aids), (*Tracking telescopes, Design), (*Satellite tracking systems, Tracking telescopes), Inertial navigation, Distance-measuring equipment, Turning flight, Pursuit courses, Star trackers, Gyroscopes, Gimbals.
Identifiers: Kalman filters, Analog simulation.

The report deals with two subject areas; (a) Navigational System Optimal Integration, and (b) Stabilization for Precision Pointing and Tracking. Under the first subject area a theoretical investigation was conducted on the possibility of using all of the navigational aids (DME, VOR, TACAN, inertial systems, Air data systems, etc) aboard aircraft to improve the navigational position accuracy of the vehicle. This investigation resulted in the development of a Kalman filter for using these inputs and an estimation of the computer size needed to perform the task of giving a more accurate position location of the aircraft. Data was obtained from NASA on DME and VOR test data and used in the program and Kalman filter developed under this work effort. The results obtained showed that for the data used the position of the aircraft can indeed be more accurately determined. Under the second subject area a design procedure and design modification for the particular instrument investigated. The primary effort was concentrated on the pointing control loop and the tracking control loop. (Modified author abstract)

AD-768 677/7GA PC$5.50/MF$1.45
Mcdonnell Douglas Electronics Co St Charles Mo
SYNCHRONIZATION STATION LOCATION STUDY METHODOLOGY DEVELOPMENT.
Final rept. 1 Oct 72-May 73 on Phase 1,
J. M. Holt, F. D. Watson, and C. J. Neumann. Jul 73, 219p FAA-RD-73-102
Contract DOT-FA73WA-3172

Descriptors: (*Time signals, Synchronization(Electronics)), (*Air traffic control systems, Time signals), Radio stations, Site selection, Aviation safety, Air traffic, Numerical analysis, Effectiveness.
Identifiers: Collision avoidance.

A technology for evaluating ground station sites on the basis of their effectiveness in disseminating time synchronization has been produced. Analytical studies have complemented the concept of computer modeling of the airspace population, then quantitatively assessing the effectiveness of various configurations and deployment of time disseminating equipments. Operations of major U.S. scheduled aircarrier aircraft operating in CONUS have been discretely modeled; for a given day and time-of-day, the altitude, latitude and longitude of each aircraft is computed. Then, air-to-air and air-to-ground communication linkages are determined. In addition to producing data for use by the computer, these processes produce maps of aircraft activity versus time of day for direct interpretation. (Modified author abstract)

AD-768 698/3GA PC$2.75/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
OPERATIONAL EVALUATION OF THE ARTS II RADAR ALPHANUMERIC DISPLAY SUBSYSTEM (RADS).
Interim rept.,
James F. Akers, and Robert A. Clark. Oct 73, 25p
Rept no. FAA-NA-73-77 FAA-RD-73-149

Descriptors: (*Air traffic control systems, *Display systems), (*Radar equipment, Display systems), Radar beacons, Automation, Acceptability.
Identifiers: Alphanumeric displays, Automated radar terminal systems, ARTS(Automated Radar Terminal Systems).

A programmable, nontracking beacon Automated Radar Terminal System (ARTS II A) was installed in a TRACON configuration at the National Aviation Facilities Experimental Center. The operational suitability of the Radar Alphanumeric Display Subsystem (RADS) was evaluated. The and Data Block Offset Switch are recommended. (Author)

AD-768 839/3GA PC$3.00/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
EVALUATION OF LARGE SCREEN DISPLAY IN THE AUTOMATED OCEANIC ATC ENVIRONMENT.
Final rept. Jan-Jul 73,
Anthony J. Spingola, and Robert L. Giordano. Oct 73, 45p Rept no. FAA-NA-73-75 FAA-RD-73-136
Contract FAA-102-150-020

Descriptors: (*Display systems, *Air traffic control systems), Automation, Feasibility studies, Viewing screens.
Identifiers: Large screen displays, Evaluation.

Specific objectives were to: (1) Determine what utility, if any, the LSD can be to the future automated oceanic ATC system. (2) Determine the most practical applications of the LSD within the automated oceanic ATC system. (3) Determine ocean air traffic controller preference, individual Cathode Ray Tube (CRT) display or LSD, for graphic presentation of ocean traffic.

AD-768 851/8GA PC$5.50/MF$1.45
Computer Sciences Corp Falls Church Va

STUDY OF OCEANIC AIRSPACE AND GROUND NETWORK CONFIGURATIONS IN SATELLITE SYSTEMS.
Final rept.,
S. A. Klein. Jul 73, 207p Rept no. CSC-4183-1
FAA-RD-73-59
Contract DOT-FA72WA-3102

Descriptors: (*Air traffic control systems, Communication satellites(Active)), Networks, Configuration, Costs, Mathematical models, Management planning.
Identifiers: Air route traffic control.

The report presents the final results of a study of oceanic airspace and ground network configurations in satellite systems. The purpose of the study was to investigate the restructuring of oceanic ATC (Air Traffic Control) airspace jurisdictional boundaries in the presence of a satellite system and to identify those future ATC jurisdictional configurations and ground facilities networks which most effectively utilize the satellite capability to obtain ground segment cost savings. The study was exploratory in nature and focused on the 1980 time frame. The analysis was limited to specified North Atlantic and Pacific oceanic regions. The evaluation of postulated CTA (Control Traffic Area) configurations was based on a cost indicator model which provides an estimate of the relative costs for ground system capital investment and operation and maintenance. The study considered only satellite systems and focused on cost differences. Therefore, the cost indicator model omitted those ground system elements common to all satellite systems and included only those factors which would change with reorganization of airspace boundaries or reallocation of ground facility tasks. In addition, the report presents detailed descriptions of the study assumptions, the cost indicator model, and the evaluation techniques, as well as a number of ancilliary results regarding the technical and institutional environment of the oceanic aviation support system and the data base requirements encountered in performing the study. (Author)

AD-768 960/7GA PC$5.25/MF$1.45
Stanford Research Inst Menlo Park Calif
SURVEY OF POSITION LOCATION TECHNIQUES FOR CDEC (COMBAT DEVELOPMENT EXPERIMENTATION CENTER).
Special rept. no. 4,
W. M. Lynch. Apr 60, 62p
Contract DA-04-351-AVI-1731

Descriptors: (*Radio navigation, Reviews), (*Surface targets, *Position finding), Radio equipment, Radio transmission, Triangulation, Networks, Hyperbolic navigation, Direction finding stations, Data transmission systems, Target acquisition.

The primary requirements for a position location system for CDEC are: (1) The system must determine position of vehicles on the ground in irregular terrain to an accuracy of 50 meters; (2) The positions of 300 vehicles must be read out at a central experiment control center in less than 30 seconds; (3) The size, weight, and power consumption of the mobile equipment must be satisfactory for installation in vehicles as small as jeeps. To insure reliable operation in very rough terrain, the equipment must not be too complex; and, (4) The system must be fully automatic and capable of operation during day or night. Once the mobile equipment is calibrated, it must not require correction or resetting during an experiment by personnel in the vehicle. The purposes of the report are to define DCEC requirements for a position location system, to determine whether any currently available navigation system would meet CDEC needs, and to make recommendations for procuring a satisfactory system.

N73-30646/6GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
VANGUARD/PLACE EXPERIMENT SYSTEM DESIGN AND TEST PLAN.
R. E. Taylor. Aug 73, 22p NASA-TM-X-70447, X-750-73-232
Conf-Proposed for Presentation at Internatl. Telemetering Conf. (Itc/USA/'73), Washington, D. C., 9-11 Oct. 1973.

Descriptors: *Aircraft communication, *Ats 3, *Ats 5, *C band, *Systems engineering, Air traffic control, Navigation satellites, Performance tests.

For abstract, see STAR 1121

N73-31604/4GA PC$9.50/MF$1.45
Applied Information Industries, Moorestown, N.J.
STUDY OF PRECISE POSITIONING AT L-BAND USING COMMUNICATIONS SATELLITES.
Final Report.
27 Oct 71, 150p NASA-CR-62095
Contract NAS6-1962

Descriptors: *Communication satellites, *Positioning, *Radio navigation, *Ultrahigh frequencies, Data reduction, Low cost, Synchronous satellites, Transponders.

For abstract, see STAR 1122

N73-31608/5GA PC$5.75/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Charles Stark Draper Lab.
SIRU DEVELOPMENT. VOLUME 2: GYRO MODULE.
Final Report.
R. Cooper, and T. Shuck. Jun 73, 73p NASA-CR-135509, R-746-VOL-2
Contracts NAS9-8242, MIT PROJ. 55-32600

Descriptors: *Gyroscopes, *Performance tests, *Strapdown inertial guidance, Instrument packages, Spacecraft design, Systems engineering.

For abstract, see STAR 1122

N73-31609/3GA PC$13.75/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Charles Stark Draper Lab.
STRAPDOWN SYSTEM PERFORMANCE OPTIMIZATION TEST EVALUATIONS (SPOT), VOLUME 1.
Final Report.
R. J. Blaha, and J. P. Gilmore. Feb 73, 235p
NASA-CR-135484, R-743-VOL-1
Contracts NAS9-6823, DSR PROJ. 55-29435

Descriptors: *Apollo spacecraft, *Gimbals, *Gyroscopes, *Strapdown inertial guidance, Instrument errors, Optimization, Performance tests.

For abstract, see STAR 1122

N73-31784/4GA PC$4.50/MF$1.45
TRW Systems Group, Redondo Beach, Calif.
THE APPLICATIONS OF SATELLITES TO COMMUNICATIONS, NAVIGATION AND SURVEILLANCE FOR AIRCRAFT OPERATING OVER THE CONTIGUOUS UNITED STATES.
Executive Summary.
J. H. Craigie, D. D. Otten, A. Garabedian, D. D. Morrison, and Dec 70, 49p NASA-CR-132794, TRW-14671-6009-R0-00
Contract NAS5-21535

Descriptors: *Communication satellites, *Navigation aids, *Satellite observation, Aircraft accidents, United states of america, Warning systems.

For abstract, see STAR 1122

N73-31915/4GA PC$5.50/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands).
THE FUTURE OF SHORT-HAUL AIR TRANSPORT WITHIN WESTERN EUROPE.
Jun 73, 69p SP-73-001

Descriptors: *Air traffic, *Airport planning, *Short haul aircraft, *V/stol aircraft, Air transportation, Europe, Helicopters.

For abstract, see STAR 1122

PATENT-3 497 962/GA Not available NTIS
Department of the Navy Washington D C
METHOD AND MEANS FOR MINIMIZING HORIZONTAL ACCELERATIONS IN SHIPBOARD VERTICAL PENDULA.
Patent,
Conrad Diehl. Filed 6 Nov 67, patented 3 Mar 70, 4p Rept nos. PAT-APPL-680 684,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D. C. 20231 $0.50.

Descriptors: (*Stabilization systems, *Patents), (*Ships, Inertial navigation), Roll, Damping, Springs, Acceleration.
Identifiers: PAT-CL-33-220, Pendulums.

The invention relates to methods and means for improving the vertical stability of a pendulum and especially for methods and means for minimizing the effects of horizontal accelerations on a pendulum. An object of the invention is to provide simple inexpensive, highly reliable means for maintaining the vertical position of a pendulum mounted on a vehicle moving in three-dimensional space despite horizontal accelerational forces, which act on the pendulum without the use of a gyroscopic element and servomechanism controls.

PATENT-3 541 503/GA Not available NTIS
Department of the Navy Washington D C
OPTICAL GLIDE SLOPE REFERENCE INDICATOR FOR AIRCRAFT.
Patent,
Hallett R. Stiles. Filed 27 Oct 69, patented 17 Nov 70, 4p Rept nos. PAT-APPL-869 523,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Optical equipment, *Patents), (*Glide path systems, *Landing aids), Terminal flight facilities, Optical equipment components, Approach, Optical images.
Identifiers: PAT-CL-340-25.

The patent relates to a device whereby an optical glide slope reference indicator simultaneously provides the pilot of an aircraft with elevation and azimuth information relative to the intended point of landing. The indicator presents on a gun-sight type reflector plate positioned in the pilot's line of sight of the landing area, a set of optically generated reference signals by which the pilot can monitor a preferred glide slope. An optical processor in the aircraft projects on the reflector plate two horizontally aligned reference symbols (datum bars) and a third symbol (meatball) which is displaced vertically between the two datum bars as a function of the position of the aircraft from the preferred glide slope. The composite optically processed image is superimposed on the reflector plate and is focused at infinity. In landing, the properly aligned glide slope indicator visual image is superimposed over the actual image of the landing area, and the aircraft is controlled by the pilot with reference to the relative position of the indicator to the desired touchdown point, as seen by the pilot, along a preselected flight path.

17H. Optical Detection

AD-768 716/3GA MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass

OPEN-LOOP TRACKING OF MOVING TARGETS WITH AN AEROBEE SOUNDING ROCKET,
R. G. Steeves, R. L. Ammons, and J. H. Hedberg.
15 Aug 73, 9p Rept no. AFCRL-TR-73-0519
Presented at the AAIA Sounding Rocket Technology Conference (3rd), Albuquerque, N. Mex., 7-9 Mar 73, report no. AIAA-73-302.
Availability: Available in microfiche only.

Descriptors: (*Optical tracking, *Sounding rockets), Payload, Control systems.
Identifiers: Aerobee 170 rockets, Aerobee.

Tracking at finite (time-varying) range between target and Aerobee introduces problems unique in the use of sounding rockets. Systems synthesis was employed to determine the optimum instrument field-of-view considering background, launch errors, pointing errors, and Aerobee and target position errors versus time. An inertially referenced three-axis attitude control was employed to maintain the target within the field-of-view using pre-programmed maneuvers based upon the predicted relationship between target and Aerobee trajectories. Flight results from on-board aspect camera correlation with target and stellar background demonstrated that a moving target can be open-loop tracked with very good accuracy through rigorous control of error sources and comprehensive mission analysis. (Author)

COM-73-50858/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
PREDICTION OF TARGET VISIBILITY FROM THE COLORS OF TARGET AND SURROUND.
Final rept.,
D. B. Judd, and A. A. Eastman. 1971, 11p
Pub. in Illum. Eng., v66 n4 p256-266 Apr 71.

Descriptors: (*Targets, Visibility), (*Visual perception, *Thresholds(Perception)), (*Color, *Detection), Background, Contrast, Variations, Retina, Test equipment, Tests.
Identifiers: *Target visibility.

The target visibilities of each of 266 combinations of target and surround colors have been measured by means of the Eastman contrast-threshold visibility meter. The targets and surrounds were Munsell papers, and the targets were of such size and distance from the observer (AAE) that they subtended 10 minutes of arc. Analysis of these data shows that a modification of the 1964 CIE uniform color space applied to the fluxes leaving target and surround accounts for two-thirds of the observed variation in visibility among the 266 combinations. This modification for 10-minute targets consists of neglecting the violet-greenyellow component of the color differences entirely and of counting the red-green component less than one-tenth that proper for 60-minute targets.

N73-30850/4GA PC$4.50/MF$1.45
Royal Observatory, Edinburgh (Scotland). Satellite Tracking Section.
HEWITT CAMERA OBSERVATIONS MADE AT EARLYPOINT ON VARIOUS SATELLITES FROM 1 JANUARY 1973 TO 31 MAY 1973.
K. S. Russell. 1 Jun 73, 46p ROE-STS-153

Descriptors: *Cameras, *Satellite tracking, Artificial satellites, Astronomical coordinates, Great britain, Photographic recording, Photographic tracking.

For abstract, see STAR 1121

N73-30851/2GA PC$3.00/MF$1.45
Royal Observatory, Edinburgh (Scotland). Satellite Tracking Section.
STOPWATCH OBSERVATIONS OF SATELLITES MADE DURING THE MONTH OF MAY 1973.
R. D. Eberst. 11 Jun 73, 19p ROE-STS-154

Descriptors: *Cosmos satellites, *Optical tracking, *Satellite tracking, Astronomical coordinates, Explorer satellites, Ogo, Tiros satellites.

For abstract, see STAR 1121

N73-31472/6GA PC$3.00/MF$1.45
Texas Univ., Austin. Dept. of Astronomy.
LUNAR LASER RANGING DATA DEPOSITED IN THE NATIONAL SPACE SCIENCE DATA CENTER: FILTERED OBSERVATIONS FOR 1971 JULY THROUGH 1971 DECEMBER AND UNFILTERED PHOTON DETECTIONS FOR 1972 JANUARY THROUGH 1972 JUNE.
J. D. Mulholland, and P. J. Shelus. Jul 73, 8p
NASA-CR-133927, RM-ASTRON-73-006
Contract NGR-44-012-219

Descriptors: *Laser range finders, *Lunar rangefinding, *Photons, *Radar reflectors, Apollo flights, Coordinates, Filtration, Lunar retroreflectors, Poisson equation, Reflecting telescopes.

For abstract, see STAR 1122

SLA-73-364/GA PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
ANALYSIS OF UNDERWATER OPTICAL DETECTION SYSTEMS UTILIZING PHOTOLUMINESCENT TARGETS.
S. G. Varnado, and K. R. Hessel. Jun 73, 44p

Descriptors: (*Optical systems, *Photoluminescence), (*Oceanography, Optical systems), Lasers, Photons, Targets, Water.

For abstract, see NSA 28 08, number 20643.

17I. Radar Detection

AD-768 378/2GA PC$7.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
PRECISION RADAR POINTING AND TRACKING USING AN ADAPTIVE KALMAN FILTER.
Master's thesis,
Raymond Lee Kolibaba. Jun 73, 97p Rept no. GGC/EE/73-9

Descriptors: (*Radar tracking, Adaptive control systems), Feedback, Mathematical models, Airborne, Radar equipment, Theses.
Identifiers: *Kalman filters, Computerized simulation, Adaptive filters, Control theory.

An Adaptive Extended Kalman Filter technique was developed to improve the tracking capabilities of an airborne tracking system. A maneuver determination technique was developed as well as an adaptive technique for the probability model of target acceleration. The computer simulation was run using four different types of data. Computation of the acceleration state was inaccurate due to imprecise modeling of the acceleration states. The adaptive technique reduced the range error of the non-adaptive filter. A maneuver was determined when a bias was detected on the range measurement residual. (Author)

AD-768 412/9GA PC$3.00/MF$1.45
Admiralty Surface Weapons Establishment Portsmouth (England)
HIGH RESOLUTION LAND CLUTTER CHARACTERISTICS.
Technical rept.,
C. J. Rigden. Jan 73, 17p Rept no. ASWE-TR-73-6
DRIC-BR-36668

Descriptors: (*Radar clutter, Terrain), (*Moving target indicators, Radar clutter), Monostatic radar, Probability, Probability density functions, Great Britain.

An investigation was made into land clutter characteristics using a monostatic radar with the high range resolution associated with an effective pulse width of approximately 15 nanoseconds. The radar used in the investigation operated at 5750 MHz and the range resolution of 15 nanoseconds was achieved by using a 100 MHz bandwidth signal processing system which included 200 to 1 pulse compression. The data acquisition was carried out by short duration peak amplitude sampling of the clutter returns from fixed bearings at consecutive 6.25 nanoseconds steps in range, over several microseconds of radar range, using an on-line digital computer. The mean clutter amplitude from several seconds of sampling at each range step was calculated and stored on paper tape for subsequent analysis. The results of analysis giving the spatial distribution of the scattering centers which comprise land clutter in areas of fairly heavy clutter are discussed. These reveal that in general with this high range resolution the larger scattering centers, in the mainly rural terrain surrounding the radar site, are well resolved, and even scattering centers with equivalent reflecting areas of less than 0.1 square metres tend to be resolved. (Author)

AD-768 413/7GA PC$4.25/MF$1.45
Technology Service Corp Santa Monica Calif
SIMULATION OF HIGH-RESOLUTION RADAR DISPLAYS OF CITY COMPLEXES,
Richard L. Mitchell, A. B. Lucero, and R. E. Harrison. Aug 73, 116p AFHRL-TR-73-11
Contract F33615-72-C-1583

Descriptors: (*Radar images, Simulation), (*Urban areas, *Radar scanning), (*Radar trainers, Target discrimination), Synthetic aperture radar, Mapping, Radar targets, Display systems, Real time, Computer programs, California.
Identifiers: Computerized simulation, North Long Beach(California), Radar mapping, GRAFV2 computer program, AN/APQ-108.

The modeling and simulation techniques capable of generating large-scale high-resolution radar displays of cultural features are investigated. Specific features include power transmission towers, buildings, railroads, bridges, storage tanks, streets, rivers, and natural terrain. In addition, the general background-type of return is also discussed. The problem of real-time simulation is assessed. The techniques have been applied to simulate radar images of a 2.25 x 2.25 mile area of North Long Beach, California, to a resolution of 20 feet. (Author)

AD-768 443/4GA PC$4.75/MF$1.45
Michigan Univ Ann Arbor Radiation Lab
A PROGRAM INCORPORATING DIFFRACTION FOR THE COMPUTATION OF RADAR CROSS SECTION,
Eugene F. Knott, and Thomas B. A. Senior. Jun 73, 53p Rept nos. 011758-2-T, Scientific-2
AFCRL-TR-73-0351
Contract F19628-73-C-0126

Descriptors: (*Radar echo areas, *Computer programs), Backscattering, Bodies of revolution, Aerospace craft, Diffraction.
Identifiers: FORTRAN.

A computer program is described that calculates the radar backscattering behavior of metallic roll symmetric bodies having one or more ring discontinuities in surface slope. The field diffracted by each surface singularity is represented by a line integral of equivalent electric and magnetic currents. The scattered field can be expressed as an integral of the physical optics currents existing over all non-diffracting portions of the surface and the equivalent currents at the singularities. However, since the equivalent currents themselves contain a physical optics component, the original currents must be modified in order to remove it. The predictions of the computer program are compared

with experimental data for cones and for a typical aerospace vehicle. Though the program is almost as efficient as one using physical optics alone, the results obtained are markedly superior. (Author)

AD-768 455/8GA PC$3.00/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
A STUDY OF THE SCATTERING PROPERTIES OF RESISTANCE CARD LOADED CONDUCTING STRIPS USING MOMENT METHODS.
Final rept. 1 Sep 72-31 Jan 73,
Leonard L. Tsai, Robert F. McKinney, Donald R. Wilton, and Chalmers M. Butler. 31 Jan 73, 48p
Rept no. LL-1-Pt-1 ESD-TR-73-59
Contract F19628-73-C-0002
Prepared in cooperation with Mississippi Univ., University. Dept. of Electrical Engineering.

Descriptors: (*Radar echo areas, Radar reflectors), Integral equations, Numerical analysis, Scattering, Tapes.
Identifiers: Method of moments.

A theory is developed for the TM analysis of a two-dimensional strip which is vanishingly thin, perfectly conducting and edge loaded. Integral equations are formulated and solved numerically for the currents on the body, and the scattered fields and radar cross sections are calculated from the currents. Numerical data are presented and a limited parameter study is undertaken. (Author)

AD-768 694/2GA PC$3.50/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
IMPROVED SPECTRUM ANALYSIS NOISE RADAR SYSTEMS.
Physical sciences research papers,
F. Sheppard Holt, John N. Pierce, and John K. Schindler. 30 Apr 73, 67p Rept nos. AFCRL-TR-73-0279, AFCRL-PSRP-547

Descriptors: (*Radar, Noise), Spectrum analyzers, Correlation techniques, Moving target indicators, Target acquisition, Power spectra.
Identifiers: Random noise, Spectrum analysis, *Noise radar.

Basic cross-correlation and spectrum analysis type noise radars are defined and analyzed. Inherent undesirable characteristics of the basic spectrum analysis type radar are discussed. A modification of the spectrum analysis radar that removes most of these undesirable characteristics is described and evaluated. A new spectrum analysis system designed to detect moving targets is presented. Comparison is made of the detection capabilities of all four noise radar systems in the presence of extraneous noise. (Author)

AD-768 771/8GA PC$3.00/MF$1.45
Army Missile Command Redstone Arsenal Ala Advanced Sensors Directorate
ANALOG-TO-DIGITAL CONVERTER TECHNOLOGY PRELIMINARY INVESTIGATION AND PROPOSAL.
Technical rept.,
James F. Lancaster, Donald W. Burlage, and Robert H. Fletcher. 7 Aug 73, 30p Rept no. RE-TR-73-25

Descriptors: (*Analog-to-digital converters, *Radar equipment), Video signals, Processing, Reviews.
Identifiers: Signal processing.

A brief introduction to analog-to-digital converters is presented, which includes both basic characteristics as well as typical error sources. Some more common types of converters are described and current state-of-the-art in this area is indicated. Various performance evaluation techniques are illustrated, and a proposed program for performing in-house analog-to-digital converter evaluations is outlined. (Author)

N73-30116/0GA PC$7.25/MF$1.45
Stanford Univ., Calif. Radioscience Lab.
STANFORD BISTATIC RADAR EXPERIMENT (S-170) ON APOLLOS 14, 15, AND 16.
Final Report.
H. T. Howard, and G. L. Tyler. Jul 73, 103p
NASA-CR-134003
Contract NAS9-10579

Descriptors: *Apollo 14 flight, *Apollo 15 flight, *Apollo 16 flight, *Radar transmission, Bistatic reflectivity, Superhigh frequencies, Ultrahigh frequencies, Very high frequencies.

For abstract, see STAR 1121

N73-30121/0GA PC$8.00/MF$1.45
Carnegie-Mellon Univ., Pittsburgh, Pa.
ELECTRO-OPTICAL PROCESSING OF PHASED ARRAY DATA.
Final Summary Report.
D. Casasent. 1 Aug 73, 119p NASA-CR-124375
Contracts NAS8-28737, C-MU PROJ. DCN-2-40-23115-(IF)

Descriptors: *Data processing equipment, *Electro-optics, *Optical equipment, *Phased arrays, *Real time operation, *Transducers, Data recording, Data systems, Radar equipment, Systems analysis.

For abstract, see STAR 1121

N73-31094/8GA PC$6.75/MF$1.45
Forschungsinstitut fuer Funk und Mathematik, Werthoven (West Germany).
SEARCH PROCEDURE FOR ELECTRONIC RADAR.
H. Dannemann. Sep 72, 92p REPT-186
In German; English Summary.

Descriptors: *Phased arrays, *Radar targets, *Search radar, Electronic control, Radar echoes, Searching, Steerable antennas.

For abstract, see STAR 1122

17J. Seismic Detection

AD-768 617/3GA PC$4.25/MF$1.45
Texas Instruments Inc Dallas Equipment Group
EXTENDED ARRAY EVALUATION PROGRAM. SPECIAL REPORT NO. 9. CONTINUED EVALUATION OF THE NORWEGIAN SHORT-PERIOD ARRAY,
Frode Ringdal, and Richard L. Whitelaw. 10 Aug 73, 108p
Contract F33657-72-C-0725, ARPA Order-1714
See also report dated 30 Apr 72, AD-753 420.

Descriptors: (*Seismological stations, Norway), (*Underground explosions, Detection), Seismometers, Networks, Earthquakes, Nuclear explosions, Signal-to-noise ratio, Power spectra, Epicenter.
Identifiers: NORSAR(Norwegian Seismic Array), Norwegian seismic array, Vela Uniform, Short period seismometers, Beamsteering, Seismic noise.

The report describes the continued evaluation of the Norwegian short-period Seismic Array (NORSAR), which was conducted by Texas Instruments Incorporated at the Seismic Data Analysis Center over the period 1 April 1972 to 31 March 1973. The major areas of study presented in this report are: Signal analysis on a regional basis; signal amplitude response patterns across the array; array processing performance; NORSAR seismic event detection capability; and behavior of short-period seismic discriminants. The total data base for this study comprises 344 events.

AD-768 638/9GA PC$2.75/MF$1.45
Teledyne Geotech Alexandria Va Seismic Data Lab
QUARTERLY TECHNICAL SUMMARY REPORT, APRIL-JUNE 1973,
Robert R. Blandford. 17 Jul 73, 14p
Contract F33657-72-C-0009, ARPA Order-1714
See also report dated 18 Apr 73, AD-760 542.

Descriptors: (*Seismological stations, Data processing systems), (*Underground explosions, Detection), Nuclear explosions, Earthquakes, Identification, Seismometers, Networks, Power spectra, Recording systems, Rayleigh waves.
Identifiers: Vela Uniform, Prime Argus project, Signal processing.

The report summarizes the work done by the SDL during the period April through June 1973, and primarily concerns the seismic research activities related to the detection and identification of nuclear explosions and earthquakes. The report also contains brief discussions of the support tasks and data services which were performed for other government contractors and for participants in the VELA-UNIFORM and PRIME ARGUS projects. (Author)

AD-768 927/6GA PC$3.50/MF$1.45
Teledyne Geotech Alexandria Va Seismic Data Lab
AUTOMATIC ARRAY AND NETWORK DETECTION IN THE PRESENCE OF SIGNAL VARIABILITY,
R. R. Blandford, and M. H. Wirth. 1 Jun 73, 67p
Rept no. SDL-308
Contract F33657-72-C-0009, ARPA Order-1714

Descriptors: (*Seismological stations, Noise), (*Underground explosions, Detection), Seismometers, Networks, Probability, Earthquakes, Nuclear explosions, Signal-to-noise ratio, Correlation techniques, Intensity, Analysis of variance.
Identifiers: Vela Uniform, Seismic arrays, Seismic detection.

Earlier theoretical work on automatic detection by an array or a network of arrays is extended to include the case where the signal amplitude varies log-normally between sensors or arrays. It was found that a 'multi-array' detector which detects on the sum of the subsystem detector outputs is substantially superior to a 'voting' detector. This result is in agreement with the few available empirical data. It is recommended that the multi-array detector be further evaluated using empirical data with a view to its use in worldwide networks and in arrays with widely spaced subarrays. Several other results are obtained which show that existing techniques for evaluating network thresholds are accurate for automatic detectors. (Modified author abstract)

AD-768 987/0GA PC$4.75/MF$1.45
Texas Instruments Inc Dallas Equipment Group
SIMULTANEOUS THREE-COMPONENT BROAD-BAND EARTH NOISE STRUCTURE AT VERY LONG PERIOD EXPERIMENT STATIONS SPECIAL REPORT NO. 10. EXTENDED ARRAY EVALUATION PROGRAM,
Stephen A. Alsup, and Ervin S. Becker. 29 Jun 73, 54p
Contract F33657-72-C-0725, ARP2a Order-1714
See also report dated 10 Aug 73, AD-768 617.

Descriptors: (*Seismological stations, Noise), (*Underground explosions, Detection), Seismometers, Power spectra, Broadband, Earthquakes, Nuclear explosions, Microseisms, Correlation techniques, Signal-to-noise ratio, Sampling.
Identifiers: Vela Uniform, Very long period seismometers, *Seismic noise, Ground motion.

A series of one-hour seismic noise samples were collected during 1971 and 1972 on the vertical, North-South, and East-West components of the VLPE seismographs. The results of converting these samples to root mean square ground motion

estimates, averaging the conversions, and computing interncomponent cross-correlations across the 13.5 to 62.5 second period are presented. The results of the study show that the power across the band is not highly correlated among components, that the RMS ground motions approximate a log normal as opposed to normal distribution, and that the vertical noise field has a lower longterm average than the horizontal field. The 'noise window' at periods between 20 and 40 seconds also appears to be narrower for the horizontal field than the vertical field. (Author)

FOA-4-4540-A-1/GA PC$4.50/MF$1.45
Forsvarets Forskningsanstalt, Stockholm (Sweden).
DEFINITION AND IDENTIFICATION OF SEISMIC EVENTS IN THE USSR IN 1971.
O. Dahlman, H. Israelson, A. Austegard, and G. Hornstrom. Jun 73, 49p
U.S. Sales Only.

Descriptors: (*Nuclear explosion detection, *Seismic waves), (*Earthquakes, *Seismic detection), Underground explosions, Ussr.

For abstract, see NSA 28 07, number 15459.

18. NUCLEAR SCIENCES AND TECHNOLOGY

RFP-1875/GA PC$4.00/MF$1.45
Dow Chemical U.S.a., Golden, Colo. Rocky Flats Div.
BATCH TWO-STAGE COUNTERCURRENT MODE FOR LIQUID PLUTONIUM--MOLTEN SALT EXTRACTION OF AMERICIUM.
J. B. Knighton, J. L. Long, R. C. Franchini, R. G. Auge, and J. C. Brown. 31 Jul 73, 9p
Contract AT(29-1)-1106

Descriptors: (*Americium, *Separation processes), (*Plutonium, Separation processes), (*Americium 241, *Isotope production), Magnesium chlorides, Molten salts, Potassium chlorides, Sodium chlorides.

For abstract, see NSA 28 08, number 18071.

18A. Fusion Devices (Thermonuclear)

BNWL-B-283/GA PC$3.75/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
THERMAL HYDRAULIC ANALYSIS OF THE PACIFIC NORTHWEST LABORATORY FUSION-FISSION HYBRID REACTOR CONCEPT.
A. M. Sutey, and C. W. Stewart. Jun 73, 35p
Contract AT(45-1)-1830

Descriptors: (*Thermonuclear reactors, *Thermodynamics), (*Htgr type reactors, Thermodynamics), Coolants, Deuterium, Fission, Helium, Hydraulics, Tritium, Uranium, Uranium carbides, Uranium oxides.

For abstract, see NSA 28 08, number 20101.

COO-3028-5/GA PC$3.00/MF$1.45
Princeton Univ., N. J. Dept. Of Chemical Engineering.
RADIATION DAMAGE EFFECTS ON HYDROGEN PERMEATION IN FUSION REACTORS.
H. K. Perkins, and R. C. Axtmann. 1972, 18p
CONF-730602-2

Descriptors: (*Thermonuclear reactors, Reactor materials), (*Pressure vessels, *Permeability), (*Reactor materials, *Physical radiation effects), Deuterium, Tritium.

For abstract, see NSA 28 07, number 17218.

IAE-2180/GA PC$3.00/MF$1.45
Institut Atomnoi Energii, Moscow (Ussr).
STUDY OF THE STRUCTURE OF A THERMONUCLEAR COMBUSTION WAVE IN A LAYER OF PLASMA BEING CONTAINED BY MATERIAL WALLS.
A. F. Nastoyashchii, and L. P. Shevchenko. 1972, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Thermonuclear reactions, *Shock waves), Electron density, Explosions, Plasma, Wall effect.

For abstract, see NSA 28 08, number 20102.

IPP-4/109/GA PC$4.00/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching (West Germany).
TRANSIENT BEHAVIOUR OF CURRENTS AND FORCES IN THE COIL SYSTEM OF THE W VII STELLARATOR, PARTICULARLY IN THE EVENT OF OPERATING TROUBLE.
H. Preis. Mar 73, 38p
In German. U.S. Sales Only.

Descriptors: (*W stellarators, *Magnet coils), Electric currents, Lorentz force, Magnetic fields, Toroidal configuration.

For abstract, see NSA 28 07, number 17219.

JUL-927-PP/GA PC$4.75/MF$1.45
Kernforschungsanlage, Juelich (West Germany).
FORCES AND MOMENTS IN ARBITRARY TOROIDAL MAGNETIC FIELD COILS SUBJECTED TO ARBITRARY EXTERNAL FORCES.
W. Zabka. Feb 73, 53p
In German. U.S. Sales Only.

Descriptors: (*Magnet coils, *Toroidal configuration), Magnetic fields, Stresses.

For abstract, see NSA 28 08, number 20103.

LA-UR-73-1053/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
REVIEW OF SCYLLAC THETA-PINCH EXPERIMENTS.
W. E. Quinn, W. R. Ellis, R. F. Gribble, C. R. Harder, and R. Kristal. 17p CONF-730705-12
Contract W-7405-eng-36

Descriptors: (*Scylla devices, *Planning), Feedback, Research programs, Stability, Theta pinch.

For abstract, see NSA 28 08, number 20109.

LA-5250-PR/GA PC$5.45/MF$1.45
Los Alamos Scientific Lab., N. Mex.
LASL CONTROLLED THERMONUCLEAR RESEARCH PROGRAM. PROGRESS REPORT FOR A 12-MONTH PERIOD ENDING DECEMBER 1972.
F. L. Ribe. Jun 73, 135p
Contract W-7405-eng-36

Descriptors: (*Thermonuclear reactors, *Research programs), Pinch effect, Toroidal configuration.

For abstract, see NSA 28 08, number 20104.

LA-5314-MS/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
DESIGN OPTIONS AND TRADE-OFFS IN SUPERCONDUCTING MAGNETIC ENERGY STORAGE WITH IRREVERSIBLE SWITCHING.
H. L. Laquer, J. D. G. Lindsay, E. M. Little, J. D. Rogers, and D. M. Weldon. Jun 73, 17p
Contract W-7405-eng-36

Descriptors: (*Superconducting magnets, *Switches), (*Theta pinch, Superconducting magnets), Cryogenics, Eddy currents, Magnet coils, Planning.

For abstract, see NSA 28 07, number 17221.

LA-tr-73-32/GA PC$4.00/MF$1.45
Institut Atomnoi Energii, Moscow (Ussr).
PROBLEMS OF MEASURING NUCLEAR CONSTANTS FOR THERMONUCLEAR REACTORS.
E. A. Kuz'min, A. A. Ogloblin, N. I. Sidorov, and A. R. Faiziev. 1972, 37p CONF-730302-14
Translated by Helen J. Dahlby (Los Alamos Scientific Lab., NM) from IAEA Paper SM--170/22.

Descriptors: (*Thermonuclear reactors, *Breeding), Alpha particles, Deuterium, Helium ions, Neutron reactions, Neutron sources, Tritium.

For abstract, see NSA 28 08, number 20108.

ORNL-TM-4050/GA PC$4.50/MF$1.45
Oak Ridge National Lab., Tenn.
MECHANICAL STRESS IN THE PRESSURE VESSEL OF A LITHIUM-FILLED, EXPLODING PELLET, THERMONUCLEAR REACTOR.
L. Dresner. Jul 73, 47p
Contract W-7405-eng-26

Descriptors: (*Thermonuclear reactors, Pressure vessels), (*Pressure vessels, *Stresses), Fuel pellets, Laser-produced plasma, Lithium, Strains.

For abstract, see NSA 28 07, number 17222.

ORNL-TM-4277/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
COUPLED NEUTRON AND GAMMA-RAY CROSS SECTION SETS FOR FUSION REACTOR CALCULATIONS.
J. T. Kriese. Aug 73, 9p
Contract W-7405-eng-26

Descriptors: (*Neutron reactions, *Thermonuclear reactors), (*Photonuclear reactions, Thermonuclear reactors), Computer codes, Cross sections, Tables.

For abstract, see NSA 28 08, number 20110.

ORNL-tr-2682/GA PC$3.50/MF$1.45
IGNITION TOKAMAK.
M. Huguet, and P. H. Rebut. 28p
Translated by R. Gregg Mansfield (Oak Ridge National Lab.) from the French.

Descriptors: (*Tokamak devices, *Planning), Aspect ratio, Beam injection heating, Cost, Magnet coils, Power supplies.

For abstract, see NSA 28 07, number 17223.

PATENT-3 740 554/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
MULTI-AMPERE DUOPIGATRON ION SOURCE.
Patent,
Ora B. Morgan, Jr. Filed 13 Apr 72, patented 19 Jun 73, 6p PAT-APPL-243 676
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Ion sources, *Patents), (*Nuclear fusion, Ion beams), Plasma control, Ion density(Concentration).
Identifiers: PAT-CL-250-41-9-SE.

The patent describes a duoplasmatron ion source which is modified to provide a large plasma surface with a uniform density at a target cathode. The target cathode and the acceleration and

deceleration electrodes are gridded or multi-apertured and are spaced in close proximity each to the others with the apertures being in alignment. With such an arrangement, it is possible to extract multi-ampere bright ion beams at energies of tens of KeV. Conversion of the ion beam to a neutral particle beam can be readily accomplished by addition of a gas cell.

PB-224 480/4GA PC$2.90/MF$1.45
Division of Controlled Thermonuclear Research (AEC), Washington, D.C.
FUSION POWER: AN ASSESSMENT OF ULTIMATE POTENTIAL.
Feb 73, 67p* WASH-1239
Paper copy also available from GPO $0.90 as Y3:AT7:22/WASH/1239.

Descriptors: (*Nuclear fusion, Assessments), Plasma control, Magnetic mirrors, Pinch effect, Laser beams, Economic forecasting, Thermonuclear reactions, Feasibility.
Identifiers: Tokamaks.

Fusion power has been recognized as having the potential of minimum environmental insult. This expectation is very general and deserves detailed backup. Because some second generation fusion reactor system designs have recently been developed, it is now possible to analyze the ultimate potential of fusion power to a meaningful extent and that is the subject of the report. The approach taken was to evaluate the projected characteristics of fusion power plants in an absolute sense but not to compare fusion systems with current or other projected energy sources.

PB-224 481/2GA PC$2.90/MF$1.45
Division of Controlled Thermonuclear Research (AEC), Washington, D.C.
FUSION POWER: RESEARCH AND DEVELOPMENT REQUIREMENTS.
Jul 73, 62p* WASH-1267
Paper copy also available from GPO $0.90 as Y3.AT7:22/WASH1267.

Descriptors: (*Nuclear fusion, Forecasting), Plasma control, Magnetic mirrors, Toroids, Pinch effect, Laser beams, Thermonuclear reactions, Feasibility, Reviews.

The present task in fusion research is to further develop under standing of the plasma state and to prepare to move to the new experiments aimed at obtaining the full combination of temperature, density, and confinement time needed to experimentally demonstrate fusion scientific feasibility. Four general approaches are now receiving major emphasis. These are steady state toroidal systems (principally the tokamak), magnetic mirror systems, pulsed high-beta pinch systems (principally the theta pinch), and laser-fusion systems. Based upon preliminary systems studies, each of these concepts appears to have the potential of being extrapolated to a practical power reactor. In addition to these main lines, supporting research is carried out which spans a broad range from basic plasma studies to relatively large-scale confinement system research. Finally, a small but growing program in fusion reactor analysis and technology is supported both to provide guidance to the plasma research and to provide an understanding of related problems which must be solved prior to the achievement of practical fusion power.

UCRL-51321/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
OPTIMIZATION OF COLLECTOR EFFICIENCY FOR DIRECT ENERGY CONVERTERS FOR FUSION REACTORS.
R. W. Moir, W. L. Barr, and T. N. Haratani. 6 Jun 73, 15p
Contract W-7405-eng-48
U.S. Sales Only.

Descriptors: (*Direct energy converters, *Efficiency), (*Thermonuclear reactors, Direct energy converters), (*Computer codes, *C codes), Electrodes, Fortran, Variational methods.

For abstract, see NSA 28 08, number 18096.

UCRL-74792/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
PROTON SIMULATION OF A FUSION REACTOR NEUTRON ENVIRONMENT.
C. M. Logan, and J. D. Anderson. Jun 73, 16p
CONF-730813-2

Descriptors: (*Copper, *Physical radiation effects), (*Thermonuclear reactors, Reactor materials), (*Reactor materials, Physical radiation effects), Mev range 10-100, Neutrons, Pressure vessels, Protons, Simulators.

For abstract, see NSA 28 07, number 17224.

18B. Isotopes

CEA-CONF-2285/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
LEGAL OUTLINES FOR CARRYING OUT THE INTERNATIONAL PLAN FOR AN ISOTOPE SEPARATION PLANT.
G. Vial. 14p CONF-730341-2
In French. U.S. Sales Only.

Descriptors: (*Uranium 235, Gaseous diffusion process), (*Gaseous diffusion process, *International cooperation), Industrial plants, Legal aspects.

For abstract, see NSA 28 07, number 15661.

CONF-730641-1/GA PC$3.25/MF$1.45
Oak Ridge National Lab., Tenn.
PREPARATION AND CALIBRATION OF EXP 252 CF NEUTRON SOURCES AT THE OAK RIDGE NATIONAL LABORATORY.
J. E. Bigelow, J. E. Jr. Van Cleve, J. B. Jr. Knauer, and L. C. Williams. 1973, 23p

Descriptors: (*Californium 252, Neutron sources), (*Neutron sources, *Calibration), Fabrication, Ornl.

For abstract, see NSA 28 07, number 15670.

DP-MS-72-35/GA PC$3.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S. C. Savannah River Lab.
LONG-TERM INTEGRITY OF EXP 252 CF SOURCE MATERIALS.
W. R. McDonell, and W. C. Mosley. 1972, 12p
CONF-720902-9
Contract AT(07-2)-1

Descriptors: (*Californium 252, *Neutron sources), (*Capsules, *Physical radiation effects), Californium oxides, Cermets, Compatibility, Embrittlement, Palladium, Performance, Platinum, Radiation hardening, Wires.

For abstract, see NSA 28 08, number 18418.

DP-MS-72-45/GA PC$3.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S. C. Savannah River Lab.
CALIFORNIUM-252 NEUTRON SOURCES.
J. L. Crandall. 1 Sep 72, 15p CONF-720902-8
Contract AT(07-2)-1

Descriptors: (*Californium 252, *Isotope production), Economics, Neutron sources, Production, Reviews, Uses.

For abstract, see NSA 28 08, number 18415.

JUL-939-NP/GA PC$6.25/MF$1.45
Kernforschungsanlage, Juelich (West Germany). Institut fuer Neutronenphysik.
COMPUTER SIMULATION OF THE MOTION OF HEAVY IONS PASSING THROUGH GAS FILLED ELECTROMAGNETIC SEPARATORS.
G. Fiebig. Mar 73, 84p
U.S. Sales Only.

Descriptors: (*Electromagnetic isotope separation, Heavy ions), (*Heavy ions, *Motion), Computer codes, Energy losses, Gases, Mathematical models, Monte carlo method, Operation, Optimization, Trajectories.

For abstract, see NSA 28 08, number 18409.

KFK-1801/GA PC$3.75/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Kernverfahrenstechnik.
OPERATING LIMITS OF A TECHNICAL SEPARATION NOZZLE STAGE FOR U-235 ENRICHMENT.
D. Seidel, and U. Sieber. May 73, 35p
In German. U.S. Sales Only.

Descriptors: (*Uranium 235, Separation nozzle method), (*Separation nozzle method, *Performance), Compressors, Enriched uranium, Operation, Pressure dependence, Uranium hexafluoride.

For abstract, see NSA 28 07, number 15664.

NP-19791/GA PC$3.00/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
CALIBRATED ACTINIDE NUCLIDE SOURCES. THE PREPARATION AND CALIBRATION OF ALPHA AND SPONTANEOUS FISSION EMITTING SOURCES OF RADIUM AND THE ACTINIDE ELEMENTS.
3p
U.S. Sales Only.

Descriptors: (*Alpha sources, *Calibration standards), (*Californium 252, *Spontaneous fission), (*Californium 250, Alpha sources), (*Uranium 233, Alpha sources), Actinides, Alpha spectroscopy, Americium 241, Curium 242, Curium 244, Plutonium 238, Plutonium 239.

For abstract, see NSA 28 07, number 15671.

18C. Nuclear Explosions

AD-768 784/1GA PC$2.75/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
A STUDY OF THE FEASIBILITY OF PARAMETER SENSITIVITY ANALYSIS OF THE DIFFUSION EQUATION AS APPLIED TO PROBLEMS IN NUCLEAR THERMAL VULNERABILITY.
Memorandum rept.,
Jeffrey H. Grotte. Sep 73, 20p Rept no. BRL-MR-2324

Descriptors: (*Nuclear explosions, Thermal radiation), (*Army equipment, Vulnerability), Heat transfer, Partial differential equations, Diffusion, Radiation effects, Numerical analysis, Thermal conductivity.

Calculational determination of the nuclear thermal vulnerability of Army equipment requires a knowledge of the specific heat and thermal conductivity of the constituant materials. Since the temperature dependence of these properties for most materials is not known, constant values are often used in heat transfer calculations. The report describes a study that was conducted to formulate general rules for predicting the sensitivity of the calculated temperatures to changes in these parameters. It was concluded that problem geometry is the governing parameter in heat transfer calculations. Therefore, it is recommended that either of two approaches be used: (1)

a worst case analysis or (2) the use of several values of specific heat and thermal conductivity to generate an envelope in which the actual value would be. (Author)

AWRE-Trans-65/GA PC$9.50/MF$1.45
FRENCH AND RUSSIAN PRESENTATIONS TO THE INTERNATIONAL ATOMIC ENERGY PANEL ON PEACEFUL NUCLEAR EXPLOSIONS. III. APPLICATIONS, CHARACTERISTICS, AND EFFECTS, VIENNA, 27--30 NOVEMBER 1972.
Mar 73, 149p CONF-721143-
Translated by F.E. Wallwork and W.E. Jones from report. U.S. Sales Only.

Descriptors: (*Nuclear explosions, *Meetings), Leading abstract, Underground explosions, Uses.

For abstract, see NSA 28 07, number 15448.

CONF-730907-6/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
EVALUATION OF NUCLEAR GAS STIMULATION IN TERMS OF POTENTIAL RADIATION EXPOSURE TO THE PUBLIC.
P. S. Rohwer, C. J. Barton, R. E. Moore, and S. V. Kaye. 1973, 18p

Descriptors: (*Natural gas, *Production), (*Human populations, *Radiation doses), Gasbuggy event, Rulison event, Uses.

For abstract, see NSA 28 08, number 18206.

FOA-4-4539-A-1/GA PC$3.00/MF$1.45
Hagfors Observatory, Stockholm (Sweden).
PRESUMED EXPLOSION IN S.W. USSR, JULY 9, 1972. EVENT REPORT NO. 7.
May 73, 10p
U.S. Sales Only.

Descriptors: (*Nuclear explosion detection, *Seismic waves), S waves, Seismic p waves, Underground explosions, Ussr.

For abstract, see NSA 28 08, number 18208.

FOA-4-4545-A-1/GA PC$4.00/MF$1.45
Forsvarets Forskningsanstalt, Stockholm (Sweden).
SEISMIC SOURCE AND TRANSMISSION FUNCTIONS FROM UNDERGROUND NUCLEAR EXPLOSIONS WITH KNOWN YIELDS AT NEVADA TEST SITE.
O. Dahlman. Jun 73, 38p
U.S. Sales Only.

Descriptors: (*Nuclear explosion detection, *Seismic waves), Mathematical models, Nevada test site, Underground explosions.

For abstract, see NSA 28 08, number 18209.

JPRS-60185/GA PC$3.50/MF$1.45
Joint Publications Research Service, Arlington, Va.
FORMATION OF RADIOACTIVE PARTICLES IN NUCLEAR EXPLOSIONS,
Yu. A. Izrael, V. N. Petrov, and Ya. I. Gaziev. 2 Oct 73, 29p
Trans. of Institut Eksperimentalnoi Meteorologii. Trudy (USSR) n21 p97-111 1971.

Descriptors: (*Nuclear explosions, Troposphere), (*Fallout, Nuclear explosions), Nuclear fireball, Elementary particles, Air pollution, Radioactive isotopes, Numerical analysis, Translations, USSR.

Contents:
Formation of radioactive particles in tropospheric nuclear explosions;
Calculation of effects of fractionation in atmospheric nuclear explosions;
On the formation of secondary aerosols in the atmosphere during a ventilated underground nuclear explosion;
Investigation of the distribution of highly active particles according to dimensions in the troposphere in September-December 1967.

NOAA-TM-ERL-ESL-22/GA PC$3.50/MF$1.45
National Oceanic and Atmospheric Administration, Las Vegas, Nev. Earth Sciences Labs.
SEISMIC BACKGROUND NOISE INVESTIGATIONS AROUND THE WAGON WHEEL SITE.
R. Navarro. Mar 73, 26p PNE-WW-29

Descriptors: (*Chemical explosions, *Seismic detection), (*Wyoming, *Seismology), (*Wagon wheel event, *Background noise), Seismic waves, Underground explosions.

For abstract, see NSA 28 08, number 18210.

NVO-1163-TM-38/GA PC$5.25/MF$1.45
Environmental Research Corp., Las Vegas, Nev.
DISTANCE ATTENUATION OF RESPONSE SPECTRA FROM UNDERGROUND NUCLEAR DETONATIONS.
R. D. Lynch. Jul 73, 62p
Contract AT(29-2)-1163

Descriptors: (*Nuclear explosions, Seismic waves), (*Seismic waves, *Wave propagation), Attenuation, Underground explosions.

For abstract, see NSA 28 08, number 18211.

PB-224 854/0GA PC$2.75/MF$1.45
Mathematics and Computation Lab. (OEP), McLean, Va.
READY I SYSTEM FOR THE UNIVAC 1108 WEAPONS PREPARATION PROGRAM,
Sally S. Miley, and Barbara V. Ely. Jun 73, 25p MCL-TM-234

Descriptors: (*Programming manuals, Nuclear explosion effects), Control sequences, FORTRAN.
Identifiers: UNIVAC 1108 computers, Ready 1 system.

The manual contains detailed instructionf for users of the Weapons Preparation Program. It contains information concerning the several options of the program, input-output formats, and operation procedures. (Author)

PB-224 855/7GA PC$3.00/MF$1.45
Mathematics and Computation Lab. (OEP), McLean, Va.
READY I SYSTEM FOR THE UNIVAC 1108 ATTACK CONDITIONS PROGRAM,
Mary D. Emerson, Barbara V. Ely, Donald E. Slawson, and James E. Barb. Jun 73, 28p MCL-TM-235

Descriptors: (*Nuclear explosion effects, *Computer programming), Fallout, Wind(Meteorology), Computation, FORTRAN.
Identifiers: Ready 1 system, UNIVAC 1108 computers.

The attack conditions program is designed to provide the READY I weapon effects program with a file containing weapon fallout trajectories. The program is designed to be run on an UNIVAC 1108 computer in conjunction with the READY I damage assessment system. (Author)

PB-224 856/5GA PC$2.75/MF$1.45
Mathematics and Computation Lab. (OEP), McLean, Va.
CHECKPOINT INTERFACE ROUTINES FOR FORTRAN V UNDER EXEC 8,
Roebert C. Peake. Jun 73, 17p MCL-TM-236

Descriptors: (*Nuclear explosion effects, *Computer programming), FORTRAN, Checkout, Programming manuals, Compiliers.
Identifiers: FORTRAN 5 programming language.

The FORTRAN 5 checkpoint interface routines were developed to provide dynamic recovery capabilities without terminating the executing program. (Author)

UCID-16259/GA PC$9.50/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
PROJECT RIO BLANCO: TECHNICAL STUDIES II.
J. Toman, and H. A. Tewes. 26 Apr 73, 149p
Contract W-7405-Eng-48

Descriptors: (*Rio blanco event, *Research programs), (*Natural gas, *Production), (*Rocks, *Physical properties), Ground motion.

For abstract, see NSA 28 07, number 15460.

UCRL-50929(Rev.1)/GA PC$5.45/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
AIDS FOR ESTIMATING EFFECTS OF UNDERGROUND NUCLEAR EXPLOSIONS.
T. R. Butkovich, and A. E. Lewis. 23 Feb 73, 104p
Contract W-7405-eng-48

Descriptors: (*Nuclear explosions, *Mechanical effects), Diagrams, Seismic effects, Underground explosions.

For abstract, see NSA 28 08, number 18212.

UCRL-51396/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
MAGNETIC INDUCTION: A SYSTEM FOR WIRELESS DOWNHOLE COMMUNICATION IN CASED HOLES.
P. W. Rodgers. 25 May 73, 17p
Contract W-7405-eng-48

Descriptors: (*Nuclear explosions, *Detonations), (*Electromagnetic radiation, *Uses), Boreholes, Communications, Control equipment, Underground explosions.

For abstract, see NSA 28 08, number 18213.

18D. Nuclear Instrumentation

ANCR-1113/GA PC$5.45/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho.
GAUSS VI: A COMPUTER PROGRAM FOR THE AUTOMATIC BATCH ANALYSIS OF GAMMA-RAY SPECTRA FROM GE(LI) SPECTROMETERS.
J. E. Cline, M. H. Putnam, and R. G. Helmer. Jun 73, 100p
Contract AT(10-1)-1375

Descriptors: (*Computer codes, G codes), (*Gamma spectrometers, *Data acquisition), (*G codes, *Gamma spectra), (*Li-drifted ge detectors, Data acquisition).

For abstract, see NSA 28 07, number 15611.

BNWL-SA-4529/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
EXTRACORPOREAL BLOOD IRRADIATOR SOURCE STUDY.
B. I. Griffin, and F. T. Cross. Jun 73, 7p CONF-730603-5
Contract AT(45-1)-1830

Descriptors: (*Blood, *Extracorporeal irradiation), (*Irradiation devices, *Design), Beta sources, Promethium 147, Strontium 90, Thulium 170, Yttrium 90.

For abstract, see NSA 28 07, number 15425.

BNWL-SA-4681/GA PC$3.75/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
LUNG COUNTER CALIBRATION AT BATTELLE-NORTHWEST.
D. L. Mayfield, and W. P. Walsh. 33p CONF-730439-1

Descriptors: (*Lungs, *Radiation monitoring), (*Whole-body counters, *Calibration), Phantoms.

For abstract, see NSA 28 08, number 18248.

CEA-CONF-2251/GA PC$4.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
SEMICONDUCTOR DETECTOR X-RAY FLUORESCENCE ANALYSIS SYSTEM.
A. Friant. 19 Feb 73, 39p CONF-721225-1
In French. U.S. Sales Only.

Descriptors: (*X-ray fluorescence analyzers, *Li-drifted si detectors), (*X-ray spectrometers, *Performance), Counting rates, Data processing, Efficiency, Energy resolution.

For abstract, see NSA 28 07, number 15647.

CEA-R-4411/GA PC$3.50/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
THERMAL NEUTRON FLUX MEASUREMENTS IN REACTORS WITH COBALT SELF POWERED NEUTRON DETECTORS.
R. Verdant. Jun 73, 30p
In French. U.S. Sales Only.

Descriptors: (*Self-powered detectors, *Performance), (*Neutron flux, Self-powered detectors), Cobalt, In core instruments, Operation, Sensitivity, Thermal neutrons.

For abstract, see NSA 28 07, number 15515.

CONF-730824-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
MODERN TECHNIQUES AND APPLICATIONS IN CHERENKOV COUNTING.
H. H. Ross, and G. T. Rasmussen. 1972, 19p

Descriptors: (*Cherenkov counters, *Operation), (*Beta sources, *Radiometric analysis), Beta detection, Performance.

For abstract, see NSA 28 08, number 18302.

FRNC-TH-300/GA PC$13.25/MF$1.45
Grenoble Univ. (France).
DEVICE FOR THE CONTINUOUS MEASUREMENT OF NEUTRON AND GAMMA RAY FLUXES IN REACTORS.
P. Vulliez. 1971, 223p
In French. U.S. Sales Only.

Descriptors: (*Self-powered detectors, *Performance), (*Fission chambers, Performance), (*Neutron flux, Fission chambers), (*Gamma detection, Self-powered detectors), In core instruments, Miniaturization, Water cooled reactors.

For abstract, see NSA 28 07, number 15516.

FRNC-TH-363/GA PC$8.50/MF$1.45
Strasbourg Univ. (France).
STUDY AND DEVELOPMENT OF A DIGITAL SYSTEM FOR THE COMMAND OF AN ASSEMBLY FOR MEASURING ANGULAR DISTRIBUTIONS AND CORRELATIONS.
J. C. Pfleger. 1972, 127p
In French. U.S. Sales Only.

Descriptors: (*Angular correlation, *Measuring instruments), (*Radiation detectors, *Digital circuits), Angular distribution, Control systems, Digital systems, Integrated circuits, Logic circuits, Remote control, Servomechanisms.

For abstract, see NSA 28 08, number 18303.

FRNC-TH-372/GA PC$13.25/MF$1.45
Paris Univ., Orsay (France).
DEVELOPMENT OF PATTERN RECOGNITION METHODS FOR BUBBLE CHAMBERS. STUDY OF HYPERCHARGE EXCHANGE REACTIONS AT 4 GEV/C.
H. Videau. 1972, 224p
In French. U.S. Sales Only.

Descriptors: (*Bubble chambers, *Data processing), (*Kaon-proton interactions, *Hypercharge), (*Streamer spark chambers, Data processing), Correlation functions, Flying spot digitizers, Gev range 10-100, Kaon beams, Kaons minus, Lambda particles, Meson resonances, Octet model, Protons, Sigma particles, Signals, Su-3 groups.

For abstract, see NSA 28 08, number 18368.

INR-1459/GA PC$3.00/MF$1.45
Institute of Nuclear Research, Warsaw (Poland).
BROAD-RANGE CURRENT-TO-FREQUENCY CONVERTER WITH ADJUSTABLE CONVERSION RATIO.
S. W. Glowacki. 1973, 8p
U.S. Sales Only.

Descriptors: (*Pulse converters, *Design), (*Ionization chambers, Pulse converters).

For abstract, see NSA 28 07, number 15517.

IPNO/HE-73-3/GA PC$3.00/MF$1.45
Paris Univ., Orsay (France). Institut de Physique Nucleaire.
EFFICIENCY CALIBRATION OF A LARGE HIGH-ENERGY NEUTRON HODOSCOPE.
J. J. Aubert, C. Broll, G. Coignet, J. Favier, and L. Massonnet. 1973, 19p
U.S. Sales Only.

Descriptors: (*Hodoscopes, *Calibration), (*Neutron detection, Hodoscopes), Accuracy, Calibration, Gev range 01-10, Gev range 10-100, Linear momentum, Multiwire proportional counters, Radiator counters.

For abstract, see NSA 28 07, number 15518.

JAERI-M-5084/GA PC$5.45/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
RECORDS OF THE RADIATION CONTROL FOR JPDR-I.
C. Saito, Y. Sasaki, T. Ogura, K. Tamura, and I. Nomura. Jan 73, 60p
In Japanese. U.S. Sales Only.

Descriptors: (*Jpdr reactor, *Radiation monitoring), Data, Dusts, Gaseous wastes, Liquid wastes, Radiation doses, Radioactive wastes, Solid wastes, Surface contamination, Waste management.

For abstract, see NSA 28 08, number 20233.

JAPFNR-115/GA PC$3.00/MF$1.45
Power Reactor and Nuclear Fuel Development Corp., Tokai (Japan).
PRESENT STATUS OF THE RESEARCH AND DEVELOPMENT ON THE FBR INSTRUMENTATION.
May 73, 5p PNC-N-241-73-27(8)
U.S. Sales Only.

Descriptors: (*Sodium cooled reactors, *Reactor instrumentation), (*Fbr type reactors, Reactor instrumentation), Failed element monitors, Flowmeters, Neutron detectors.

For abstract, see NSA 28 08, number 20294.

KAPL-P-3965/GA PC$4.25/MF$1.45
Knolls Atomic Power Lab., Schenectady, N. Y.
MANUAL OR AUTOMATED AND COMPUTERIZED TLD SYSTEM FOR PERSONNEL AND ENVIRONMENTAL RADIATION EXPOSURE MONITORING.
R. Zendle, B. F. Schunicht, and R. J. Champagne. 1973, 41p CONF-730603-10
Contract W-31-109-eng-52

Descriptors: (*Thermoluminescent dosemeters, *Performance testing), Personnel dosimetry, Readout systems.

For abstract, see NSA 28 08, number 18333.

KFKI-73-18/GA PC$3.00/MF$1.45
Magyar Tudomanyos Akademia Kozponti Fizikai Kutato Intezete, Budapest.
IONIZATION CHAMBER SYSTEM FOR HIGH DOSE-RATE-MEASUREMENTS IN MIXED N-GAMMA FIELD.
P. Zarand. Apr 73, 17p
U.S. Sales Only.

Descriptors: (*Ionization chambers, *Design), (*Gamma dosimetry, Ionization chambers), (*Neutron dosimetry, Ionization chambers), Aluminium, Argon, Calibration, Carbon dioxide, Efficiency, Ethylene, Graphite, Performance, Tissue-equivalent materials.

For abstract, see NSA 28 08, number 18332.

LBL-1779/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
KRYPTON-85: A REVIEW OF INSTRUMENTATION FOR ENVIRONMENTAL MONITORING.
R. J. Budnitz. Apr 73, 18p CONF-730915-1
Contract W-7405-eng-48

Descriptors: (*Krypton 85, *Radiation monitoring), Beta sources, Comparative evaluations, Earth atmosphere, Environment, Fuel reprocessing plants, Gaseous wastes, Geiger-mueller counters, Ionization chambers, Liquid scintillation detectors, Maximum permissible concentration, Nuclear power plants, Performance, Plastic scintillation detectors, Radiation monitors, Surface air.

For abstract, see NSA 28 08, number 18233.

MLM-1971/GA PC$4.00/MF$1.45
Mound Lab., Miamisburg, Ohio.
DEVELOPMENT AND USE OF AN ENERGY-INSENSITIVE NEUTRON COUNTER.
R. A. Neff. 31 Jul 73, 11p
Contract AT-33-1-GEN-53

Descriptors: (*Neutron detection, Bf3 counters), (*Bf3 counters, *Performance), (*Moderating detectors, Performance), (*Neutron sources, *Calibration), Efficiency.

For abstract, see NSA 28 08, number 18306.

MRR-112/GA PC$3.25/MF$1.45
Technische Universitaet Muenchen, Garching (West Germany). Laboratorium fuer Reaktorregelung und Anlagensicherung.
RECENT DEVELOPMENTS IN MEASUREMENT TECHNIQUES, DATA PROCESSING, AND RELIABILITY INVESTIGATIONS WITH RESPECT TO POWER REACTOR PLANTS.
W. Bastl. Dec 72, 23p CONF-720479-1
U.S. Sales Only.

Descriptors: (*Reactor instrumentation, *Reviews), In core instruments, Mechanical vibrations, Neutron detectors, Reliability, Safety engineering, Snr reactor.

For abstract, see NSA 28 08, number 20372.

N-73-17575/GA PC$5.45/MF$1.45
Lockheed Electronics CO., Inc., Houston, Tex. (Usa). Houston Aerospace Systems Div.
ELECTRON--PROTON SPECTROMETER DESIGN SUMMARY.
Jun 72, 147p NASA-CR-128702
Contract NAS9-11373

Descriptors: (*Beta spectrometers, *Design), (*Proton spectrometers, Design), Radiation doses, Satellites, Si semiconductor detectors.

For abstract, see NSA 28 08, number 18349.

N-73-18826/GA PC$4.00/MF$1.45
California Inst. Of Tech., Pasadena.
DEVELOPMENT AND INVESTIGATION OF PARTICLE DETECTORS IN SUPPORT OF OUTER PLANET DEFINITION STUDIES. FINAL REPORT, 1 JULY 1971--30 SEPTEMBER 1972.
R. E. Vogt. 30 Sep 72, 24p NASA-CR-130917

Descriptors: (*Radiation detectors, *Research programs), Space flight.

For abstract, see NSA 28 08, number 18307.

NP-19815/GA PC$9.50/MF$1.45
Grenoble Univ. (France).
STUDY OF A DETECTOR FOR HIGH-ENERGY PARTICLES: THREE-DIMENSIONAL PROJECTION CHAMBER.
A. Breskin. 30 May 72, 146p
In French. U.S. Sales Only.

Descriptors: (*Projection spark chambers, *Design), Fabrication, Reviews.

For abstract, see NSA 28 08, number 18369.

N73-30424/8GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SHAPED SCINTILLATION DETECTOR SYSTEMS FOR MEASUREMENTS OF GAMMA RAY FLUX ANISOTROPY.
J. I. Trombka, J. I. Vette, F. W. Stecker, E. L. Eller, and W. T. Wildes. Aug 73, 31p NASA-TM-X-70445, X-641-73-230

Descriptors: *Angular distribution, *Gamma rays, *Photons, *Radiation detectors, Anisotropy, Cosmic ray albedo, Flux (Rate).

For abstract, see STAR 1121

N73-30431/3GA PC$3.50/MF$1.45
Istituto Superiore di Sanita, Rome (Italy). Lab. Di Fisica.
A NEW SOLID STATE DETECTOR TO MEASURE ENERGY AND POSITION OF CHARGED PARTICLES.
A. Calicchia. 29 Apr 72, 29p ISS-72/7
In Italian; English Summary.

Descriptors: *Charged particles, *Radiation counters, *Solid state, Ionization chambers, Semiconductors (Materials).

For abstract, see STAR 1121

N73-31415/5GA PC$3.75/MF$1.45
San Francisco Univ., Calif. Dept. of Physics.
ON PARTICLE TRACK DETECTORS.
Interim Report No. 27.
E. V. Benton, T. A. Gruhn, and C. H. Andrus. Jun 73, 35p NASA-CR-124381
Contract NAS8-26758

Descriptors: *Etching, *Particle trajectories, *Polycarbonates, *Polymeric films, *Sodium hydroxides, Data systems, Radiation counters, Surfactants, Ultraviolet absorption.

For abstract, see STAR 1122

N73-31618/4GA PC$4.25/MF$1.45
AEG-Telefunken, Frankfurt (West Germany). Fachgebiet Leistungsreaktoren.
MOBILE CHAMBER SYSTEM FOR CALIBRATION OF FIXED INCORE PROBES.
M. Stimler. Dec 72, 42p BMBW-FB-K-72-26
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
In German; English Summary.

Descriptors: *Calibrating, *Radiation detectors, *Reactor cores, *Test chambers, Mobility, Neutron flux density, Prototypes.

For abstract, see STAR 1122

PATENT-3 736 429/GA Not available NTIS
Atomic Energy Commission, Washington, D.C.
RANDOM SOURCE INTERROGATION SYSTEM.
Patent,
John E. Foley. Filed 28 Jun 72, patented 29 May 73, 5p PAT-APPL-266 961
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Neutron counters, *Patents), (*Fissionable materials, Assaying), Coincidence circuits, Uranium 235, Plutonium 239, Nuclear materials management.
Identifiers: PAT-CL-250-71-5-R.

A system to assay fissionable material is described in the patent. It consists of a sample container, a neutron source of americium-lithium, lead shielding, a plastic scintillator neutron detector using fast photomultiplier tubes electrically connected to a coincidence logic system, and rotating the sample by any well known means along with varying the position of the said neutron source.

PATENT-3 752 986/GA Not available NTIS
General Electric Co., Philadelphia, Pa.
COMPTON SCATTER ATTENUATION GAMMA RAY SPECTROMETER.
Patent.
W. E. Austin. Patented 14 Aug 73, 11p NASA-CASE-MFS-21441-1,
Misc-Filed 3 Mar. 1972 Supersedes N72-25427 (10 - 16, p 2155). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Gamma rays, *Radiation measuring instruments, *Spectrometers, Compton effect, Fast neutrons, Nuclear rocket engines, Patents.

A gamma ray spectrometer is described for use in intense radiation fields such as those in the vicinity of a rocket engine exhaust. A collimated radiation beam is Compton scattered toward shielded spectrometers to reduce the energy and intensity of the radiation and is energy selective among the spectrometers. The scattering targets are changeable to control the percentage of the radiation scattered. Sum-Compton coincidence techniques are employed for data selection.

RI-73/5/GA PC$9.50/MF$1.45
Paris Univ., Orsay (France).
STUDY AND MANUFACTURE OF A MAGNETIC DETECTOR WITH A LARGE SOLID ANGLE FOR COLLISION RINGS.
A. Cordier. May 73, 150p
In French. U.S. Sales Only.

Descriptors: (*Colliding beams, *Magnetic spectrometers), (*Multiwire proportional counters, *Design), (*Storage rings, Magnetic spectrometers), Operation.

For abstract, see NSA 28 07, number 15630.

RL-73-19/GA PC$3.00/MF$1.45
Rutherford High Energy Lab., Chilton (England).
DESIGN LOADING ANALYSIS OF A TRACK SENSITIVE TARGET IN A BUBBLE CHAMBER.
B. Mack. May 73, 12p
U.S. Sales Only.

Descriptors: (*Bubble chambers, *Targets), Containers, Equations, Fluid flow, Hydrodynamics, Hydrogen, Liquids, Particle tracks, Pressure dependence, Specifications, Stress analysis, Stresses.

For abstract, see NSA 28 07, number 15631.

RL-73-26/GA PC$3.00/MF$1.45
Rutherford High Energy Lab., Chilton (England).
OPERATION OF TRACK SENSITIVE TARGETS IN A NEON HYDROGEN BUBBLE CHAMBER.
H. Leutz, and P. R. Williams. Apr 73, 6p CONF-730531-2
U.S. Sales Only.

Descriptors: (*Bubble chambers, *Targets), Diagrams, Hydrogen, Neon, Operation, Particle tracks, Performance, Plexiglas, Sensitivity, Specifications, Stainless steels.

For abstract, see NSA 28 07, number 15632.

RL-73-34/GA PC$7.50/MF$1.45
Rutherford High Energy Lab., Chilton (England).
DESIGN FOR THERMAL NEUTRON POLARIZATION ANALYSIS DIFFRACTOMETER WITH A FILTER CONTAINING POLARIZED SAMARIUM-149 NUCLEI AS THE SPIN ANALYSER.
W. G. Williams. May 73, 106p
U.S. Sales Only.

Descriptors: (*Neutron beams, *Spin orientation), (*Polarimeters, Neutron beams), Cross sections, Elastic scattering, Filters, Inelastic scattering, Neutron diffraction, Nuclei, Polarization-asymmetry ratio, Polarized beams, Samarium 149, Specifications, Spin, Spin flip, Thermal neutrons.

For abstract, see NSA 28 07, number 15649.

RT/EL-(73)3/GA PC$4.25/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
MEASUREMENTS OF THE WIDENING OF THE LINES CAUSED BY THE ENTRAPMENT OF A CHARGE IN GERMANIUM CRYSTAL DETECTORS.
A. Barlocci, D. Coiante, G. Emiliani, and L. Parisi Presicce. 18 Jan 73, 44p
In Italian. U.S. Sales Only.

Descriptors: (*Li-drifted ge detectors, *Energy resolution), Charge carriers, Line broadening, Trapping.

For abstract, see NSA 28 07, number 15521.

UCRL-74855/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
NEUTRON DOSIMETRY STUDIES AT LLL.
R. V. Griffith. 9 Jul 73, 7p CONF-730647-1

Descriptors: (*Neutron dosimetry, *Research programs), Calibration, Neutron sources, Neutron spectroscopy.

For abstract, see NSA 28 08, number 18335.

UUIP-804/GA PC$3.00/MF$1.45
Uppsala Univ. (Sweden). Inst. Of Physics.
TECHNIQUES FOR FAST EVALUATION OF GE(LI)-DETECTOR GAMMA-RAY SPECTRA WITH SMALL COMPUTERS.
B. Nyman. Feb 73, 18p
U.S. Sales Only.

Descriptors: (*Gamma spectra, *Data processing), Computer calculations, G codes, Gamma spectrometers, Li-drifted ge detectors, Line widths, Pdp computers, Peaks.

For abstract, see NSA 28 07, number 15618.

UUIP-818/GA PC$4.25/MF$1.45
Uppsala Univ. (Sweden). Inst. Of Physics.
DESIGN PRINCIPLES IN ELECTRON SPECTROSCOPY.
B. Wannberg, U. Gelius, and K. Siegbahn. Apr 73, 43p
U.S. Sales Only.

Descriptors: (*Electrostatic spectrometers, *Photoelectron spectroscopy), Beta spectroscopy, Design, Luminosity, Monochromators, Resolution, Specifications, Transmission, X radiation.

For abstract, see NSA 28 07, number 15619.

ZJE-137/GA PC$9.50/MF$1.45
Institute of Nuclear Research, Swierk (Poland). Skoda Works, Pilsen (Czechoslovakia). Nuclear Power Construction Dept.
INTERCOMPARISON OF REACTOR CALORIMETERS. PROCEEDINGS OF THE INTERNATIONAL SEMINAR, SWIERK, POLAND, MAY 15--27, 1972.
1973, 146p
U.S. Sales Only.

Descriptors: (*Ewa-10 reactor, *Radiation doses), (*Calorimetric dosemeters, *Meetings), Calorimeters, Comparative evaluations, Gamma radiation, Measuring methods, Neutron flux, Performance.

For abstract, see NSA 28 07, number 17467.

18E. Nuclear Power Plants

AECL-4508/GA PC$4.75/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario).
AECL ANNUAL REPORT, 1972--1973.
23 May 73, 52p
U.S. Sales Only.

Descriptors: (*Nuclear power, *Research programs), (*Radioisotopes, Research programs), (*Nuclear physics, Research programs), (*Radiation chemistry, Research programs), Biology, Canada.

For abstract, see NSA 28 08, number 20228.

BNWL-SA-4670/GA PC$3.50/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
NATIONAL ENVIRONMENTAL POLICY ACT AND NUCLEAR POWER PLANT LICENSING.
D. B. Shipler, and R. F. Foster. Apr 73, 26p
CONF-730447-1
Contract AT(45-1)-1830

Descriptors: (*Nuclear power plants, *Environment), Legal aspects, Reactor licensing, Usa.

For abstract, see NSA 28 08, number 20427.

BNWL-SA-4722/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
TOMORROW'S ENVIRONMENTAL BENEFIT/COST ANALYSIS.
J. B. Burnham. 17 May 73, 18p

Descriptors: (*Nuclear power plants, *Cost benefit analysis), Environment, Health hazards, Human populations.

For abstract, see NSA 28 07, number 15492.

DOCKET-STN-50437-1/GA PC$28.50/MF$1.45
Offshore Power Systems, Jacksonville, Fla. (Usa).
OFFSHORE POWER SYSTEMS. PLANT DESIGN REPORT, VOL. 1.
1 May 73, 528p

Descriptors: (*Platform mounted nuclear plants, *Design), Containment buildings, Environment, Geology, Ice condensers, Interfaces, Offshore sites, Planning, Power, Radiation doses, Reactor licensing, Reactor sites, Seismology, Shielding, Waves, Wind.

For abstract, see NSA 28 08, number 20509.

DOCKET-STN-50437-2/GA PC$44.25/MF$1.45
Offshore Power Systems, Jacksonville, Fla. (Usa).
OFFSHORE POWER SYSTEMS. PLANT DESIGN REPORT, VOL. 2.
1 May 73, 845p

Descriptors: (*Platform mounted nuclear plants, *Design), Buildings, Computer codes, Loss of coolant, Mechanical structures, Missile protection, Offshore sites, Reactor components, Reactor licensing, Reactor safety, Regulations, Safety, Waves, Wind.

For abstract, see NSA 28 08, number 20510.

DOCKET-STN-50437-3/GA PC$24.25/MF$1.45
Offshore Power Systems, Jacksonville, Fla. (Usa).
OFFSHORE POWER SYSTEMS. PLANT DESIGN REPORT, VOL. 3.
1 May 73, 443p

Descriptors: (*Platform mounted nuclear plants, *Design), Control equipment, Electric power, Electrical equipment, Electronic equipment, Engineered safety systems, Pumps, Reactor control systems, Reactor licensing, Rhr systems, Steam generators.

For abstract, see NSA 28 08, number 20511.

DOCKET-STN-50437-4/GA PC$42.50/MF$1.45
Offshore Power Systems, Jacksonville, Fla. (Usa).
OFFSHORE POWER SYSTEMS. PLANT DESIGN REPORT, VOL. 4.
1 May 73, 806p

Descriptors: (*Platform mounted nuclear plants, *Design), Air conditioning, Cooling, Electric generators, Heating, Monitoring, Nuclear fuels, Offshore sites, Radioactive wastes, Reactor licensing, Steam lines, Turbines, Ventilation, Waste management.

For abstract, see NSA 28 08, number 20512.

DOCKET-STN-50437-5/GA PC$38.50/MF$1.45
Offshore Power Systems, Jacksonville, Fla. (Usa).
OFFSHORE POWER SYSTEMS. PLANT DESIGN REPORT, VOL. 5.
1 May 73, 727p

Descriptors: (*Platform mounted nuclear plants, *Design), Quality assurance, Radiation protection, Reactor accidents, Reactor licensing, Specifications, Testing.

For abstract, see NSA 28 08, number 20513.

DOCKET-STN-50437-6/GA PC$15.50/MF$1.45
Offshore Power Systems, Jacksonville, Fla. (Usa).
OFFSHORE POWER SYSTEMS. ENVIRONMENTAL REPORT, SUPPLEMENT TO MANUFACTURING LICENSE APPLICATION.
May 73, 266p

Descriptors: (*Platform mounted nuclear plants, *Environment), Fabrication, Industrial plants, Licensing, Licensing, Offshore sites, Reactor sites, Site selection.

For abstract, see NSA 28 08, number 20514.

DOCKET-STN-50437-7/GA PC$27.75/MF$1.45
Offshore Power Systems, Jacksonville, Fla. (Usa).
OFFSHORE POWER SYSTEMS. APPLICATION FOR MANUFACTURING LICENSE AND SUPLEMENTAL INFORMATION.
May 73, 517p

Descriptors: (*Platform mounted nuclear plants, *Fabrication), Financial data, Industrial plants, Licensing, Site selection.

For abstract, see NSA 28 08, number 20515.

DOCKET-STN-50447-1/GA PC$22.00/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
GENERAL ELECTRIC STANDARDS SAFETY ANALYSIS REPORT, BWR/6. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 1.
26 Jul 73, 396p

Descriptors: (*Bwr/6 type reactors, *Design), Mechanical structures, Nuclear power plants, Reactor licensing, Reactor safety, Reactor sites, Specifications, Standards.

For abstract, see NSA 28 08, number 20516.

DOCKET-STN-50447-2/GA PC$25.50/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
GENERAL ELECTRIC STANDARDS SAFETY ANALYSIS REPORT, BWR/6. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 2.
26 Jul 73, 468p

Descriptors: (*Bwr/6 type reactors, *Design), Control systems, Electrical equipment, Environment, Hydraulics, Mechanical structures, Reactor instrumentation, Reactor licensing, Reactor safety, Seismic effects, Standards.

For abstract, see NSA 28 08, number 20517.

DOCKET-STN-50447-3/GA PC$21.25/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
GENERAL ELECTRIC STANDARDS SAFETY ANALYSIS REPORT, BWR/6. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 3.
26 Jul 73, 384p

Descriptors: (*Bwr/6 type reactors, *Design), Engineered safety systems, Reactor cooling systems, Reactor licensing, Reactor safety, Standards.

For abstract, see NSA 28 08, number 20518.

DOCKET-STN-50447-4/GA PC$20.00/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
GENERAL ELECTRIC STANDARDS SAFETY ANALYSIS REPORT, BWR/6. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 4.
26 Jul 73, 359p

Descriptors: (*Bwr/6 type reactors, *Design), Containment systems, Control systems, Eccs, Engineered safety systems, Neutron monitors, Reactor control systems, Reactor instrumentation, Reactor licensing, Reactor safety, Reactor shutdown, Scram, Standards.

For abstract, see NSA 28 08, number 20519.

DOCKET-STN-50447-5/GA PC$25.50/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
GENERAL ELECTRIC STANDARDS SAFETY ANALYSIS REPORT, BWR/6. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 5.
26 Jul 73, 470p

Descriptors: (*Bwr/6 type reactors, *Design), Air conditioning, Cooling, Electric generators, Electric power, Heating, Nuclear fuels, Reactor licensing, Reactor safety, Remote handling, Standards, Steam lines, Storage, Turbines, Ventilation, Water.

For abstract, see NSA 28 08, number 20520.

DOCKET-STN-50447-6/GA PC$24.00/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
GENERAL ELECTRIC STANDARDS SAFETY ANALYSIS REPORT, BWR/6. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 6.
26 Jul 73, 437p

Descriptors: (*Bwr/6 type reactors, *Design), Design basis accidents, Nonradioactive wastes, Radiation protection, Radioactive wastes, Reactor accidents, Reactor licensing, Reactor operation, Reactor safety, Reactor start-up, Standards, Testing, Waste management.

For abstract, see NSA 28 08, number 20521.

DOCKET-STN-50447-7/GA PC$18.25/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
GENERAL ELECTRIC STANDARDS SAFETY ANALYSIS REPORT, BWR/6. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 7.
26 Jul 73, 324p

Descriptors: (*Bwr/6 type reactors, *Design), Control, Management, Quality assurance, Reactor licensing, Reactor operation, Reactor safety, Specifications, Standards, Testing.

For abstract, see NSA 28 08, number 20522.

DOCKET-50133-124/GA PC$4.25/MF$1.45
Pacific Gas and Electric CO., San Francisco, Calif.
HUMBOLDT BAY POWER PLANT, UNIT 3. FINAL SAFETY ANALYSIS REPORT, PROPOSED AMENDMENT, JULY 13, 1973.
13 Jul 73, 45p

Descriptors: (*Humboldt bay reactor, *Reactor safety), Blowdown, Modifications, Pipelines, Reactor licensing, Ruptures, Steam lines.

For abstract, see NSA 28 08, number 20428.

DOCKET-50184-11/GA PC$3.00/MF$1.45
Division of Reactor Licensing (Aec), Washington, D. C.
NATIONAL BUREAU OF STANDARDS REACTOR. REQUEST FROM AEC FOR ADDITIONAL INFORMATION ON SUPPLEMENT A OF FINAL SAFETY ANALYSIS REPORT.
7 Dec 66, 6p

Descriptors: (*Nbsr reactor, *Reactor safety), Coatings, Confinement, Containment buildings, Eccs, Elastomers, Electric power, Filters, Liquid wastes, Modifications, Nuclear fuels, Personnel, Radiation doses, Radioactive wastes, Reactivity insertions, Reactor control systems, Reactor licensing, Reactor start-up, Reliability, Remote handling, Seismic effects, Tritium, Valves.

For abstract, see NSA 28 08, number 20429.

DOCKET-50184-12/GA PC$3.00/MF$1.45
National Bureau of Standards, Washington, D. C.
NATIONAL BUREAU OF STANDARDS REACTOR. REPORT ON THE DIFFERENCE BETWEEN THE CALCULATED AND MEASURED REACTIVITY.
8 Mar 68, 9p

Descriptors: (*Nbsr reactor, *Reactivity), Burnup, Critical mass, Nuclear fuels, Reactor cores, Reactor licensing, Reactor safety, Xenon.

For abstract, see NSA 28 08, number 20430.

DOCKET-50184-13/GA PC$3.00/MF$1.45
National Bureau of Standards, Washington, D. C.
NATIONAL BUREAU OF STANDARDS REACTOR. REPORT ON FAILURE OF SHIM ARM 4 TO DROP FULLY UPON SCRAM.
10 May 68, 6p

Descriptors: (*Nbsr reactor, *Shim rods), Failures, Operation, Reactor control systems, Reactor licensing, Reactor shutdown, Scram.

For abstract, see NSA 28 08, number 20431.

DOCKET-50184-14/GA PC$3.00/MF$1.45
National Bureau of Standards, Washington, D. C.
NATIONAL BUREAU OF STANDARDS REACTOR. REPORT ON SLOW RELEASE TIME OF SHIM ARM 4.
19 Jul 68, 4p

Descriptors: (*Nbsr reactor, *Shim rods), Operation, Performance, Reactor control systems, Reactor licensing, Scram.

For abstract, see NSA 28 08, number 20432.

DOCKET-50245-234/GA PC$3.25/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. CASK DROP PREVENTION SYSTEM.
29 Jun 73, 23p

Descriptors: (*Millstone-1 reactor, *Spent fuel casks), Casks, Cranes, Damage, Modifications, Reactor licensing, Reactor safety, Remote handling.

For abstract, see NSA 28 08, number 20433.

DOCKET-50245-235/GA PC$6.50/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. FEEDWATER SPARGER FAILURE, INTERIM REPORT, ADDENDUM 1.
29 Jun 73, 89p

Descriptors: (*Millstone-1 reactor, *Spargers), Failures, Feedwater, Mechanical vibrations, Reactor licensing, Testing.

For abstract, see NSA 28 08, number 20434.

DOCKET-50245-236/GA PC$3.25/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. SUPPLEMENT 2 TO THE FULL-TERM OPERATING LICENSE APPLICATION DATED SEPTEMBER 1, 1972.
16 Jul 73, 22p

Descriptors: (*Millstone-1 reactor, *Quality assurance), Fabrication, Reactor licensing, Reactor operation, Reactor safety, Testing.

For abstract, see NSA 28 08, number 20435.

DOCKET-50245-237/GA PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. REPORT DESCRIBING EFFORTS TO IMPROVE MSIV RELIABILITY, JUNE 28, 1973.
28 Jun 73, 6p

Descriptors: (*Millstone-1 reactor, *Valves), Cleaning, Closures, Reactor licensing, Reliability, Repair, Specifications, Steam lines.

For abstract, see NSA 28 08, number 20436.

DOCKET-50245-238/GA PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. ADDITIONAL INFORMATION ON FEEDWATER SPARGER FAILURES, JUNE 29, 1973.
29 Jun 73, 2p

Descriptors: (*Millstone-1 reactor, *Spargers), Design, Failures, Feedwater, Mechanical vibrations, Reactor licensing.

For abstract, see NSA 28 08, number 20437.

DOCKET-50245-239/GA PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. PROPOSED CHANGE RELATING TO THE ISOLATION CONDENSER SYSTEM, JUNE 29, 1973.
29 Jun 73, 8p

Descriptors: (*Millstone-1 reactor, *Isolation condensers), Control systems, Feedwater, Modifications, Pipes, Reactor licensing, Reactor safety, Reactor shutdown, Ruptures, Steam lines, Valves.

For abstract, see NSA 28 08, number 20438.

DOCKET-50245-240/GA PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. REPORT ON THE FUEL POOL LINER LEAKAGE AND REPAIR, NOVEMBER 22, 1971--SEPTEMBER 16, 1972.
29 Jun 73, 11p

Descriptors: (*Millstone-1 reactor, *Spent fuel storage), Cracks, Defects, Fuel pools, Leak testing, Leaks, Liners, Magnetic properties, Reactor licensing, Repair, Shrinkage, Stainless steels, Tanks, Testing, Welded joints.

For abstract, see NSA 28 08, number 20439.

DOCKET-50245-241/GA PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. PROPOSED CHANGE RELATING TO THE ISOLATION CONDENSER SYSTEM, JULY 9, 1973.
9 Jul 73, 4p

Descriptors: (*Millstone-1 reactor, *Isolation condensers), Control systems, Feedwater, Modifications, Pipes, Reactor licensing, Reactor safety, Reactor shutdown, Ruptures, Valves.

For abstract, see NSA 28 08, number 20440.

DOCKET-50245-242/GA PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. PROPOSED CHANGE RELATING TO THE ISOLATION CONDENSER SYSTEM, JULY 11, 1973.
11 Jul 73, 11p

Descriptors: (*Millstone-1 reactor, *Isolation condensers), Control systems, Modifications, Pipes, Reactor licensing, Reactor safety, Reactor shutdown, Ruptures, Switches, Valves.

For abstract, see NSA 28 08, number 20441.

DOCKET-50245-243/GA PC$13.00/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE POINT NUCLEAR POWER STATION, UNIT 1. RADWASTE MODIFICATION.
12 Jul 73, 216p

Descriptors: (*Millstone-1 reactor, *Radioactive wastes), Demineralizers, Filters, Gaseous wastes, Krypton, Liquid wastes, Modifications, Reactor licensing, Recombiners, Solid wastes, Stack disposal, Waste disposal, Waste processing, Xenon.

For abstract, see NSA 28 08, number 20442.

DOCKET-50245-244/GA PC$3.75/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. REACTOR CONTROL BLADE EVALUATION, SPECIAL REPORT, JULY 23, 1973.
23 Jul 73, 35p

Descriptors: (*Millstone-1 reactor, *Reactor control systems), Boron carbides, Compacting, Control elements, Defects, Fabrication, Feedwater, Monitoring, Reactivity, Reactor licensing, Reactor operation, Reactor safety, Spargers.

For abstract, see NSA 28 08, number 20443.

DOCKET-50245-245/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. REGULATORY OPERATIONS BULLETIN NO. 73-3, REPORT ON DEFECTIVE HYDRAULIC SHOCK SUPPRESSORS AND RESTRAINTS.
27 Jul 73, 3p

Descriptors: (*Millstone-1 reactor, *Hydraulic control devices), Defects, Inspection, Reactor licensing.

For abstract, see NSA 28 08, number 20444.

DOCKET-50245-246/GA PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. ABNORMAL OCCURRENCE AO-73-8.
2 Aug 73, 2p

Descriptors: (*Millstone-1 reactor, *Lpci), Failures, Operation, Reactor licensing, Scram, Specifications, Switches, Valves.

For abstract, see NSA 28 08, number 20445.

DOCKET-50245-247/GA PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 1. SPECIAL REPORT ON REACTOR CONTROL BLADE EVALUATION, SUPPLEMENT 1, JULY 23, 1973.
26 Jul 73, 9p

Descriptors: (*Millstone-1 reactor, *Control elements), Reactivity worths, Reactor control systems, Reactor licensing, Reactor shutdown, Specifications.

For abstract, see NSA 28 08, number 20446.

DOCKET-50255-168/GA PC$10.00/MF$1.45
Consumers Power CO., Jackson, Mich.
PALISADES PLANT. REQUEST FOR CHANGE TO THE TECHNICAL SPECIFICATIONS, LICENSE NO. DPR-20, AMENDMENT 4.
13 Jul 73, 159p

Descriptors: (*Palisades-1 reactor, *Inspection), Buildings, Containment, Openings, Pipelines, Reactor licensing, Reactor operation, Ruptures, Specifications, Thickness.

For abstract, see NSA 28 08, number 20447.

DOCKET-50269-118/GA PC$15.00/MF$1.45
Duke Power CO., Charlotte, N.C.
OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 42, REVISION NO. 29.
29 Jun 73, 256p DOCKET-50270-94, DOCKET-50287-84

Descriptors: (*Oconee-1 reactor, *Reactor safety), (*Oconee-2 reactor, Reactor safety), (*Oconee-3 reactor, Reactor safety), Operation, Reactor licensing, Reactor shutdown, Reactor start-up, Scram, Specifications, Testing, Valves.

For abstract, see NSA 28 08, number 20448.

DOCKET-50269-119/GA PC$8.50/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
OCONEE NUCLEAR POWER STATION, UNIT 1. SAFETY EVALUATION REPORT BY DRL, JULY 10, 1973.
10 Jul 73, 129p

Descriptors: (*Oconee-1 reactor, *Eccs), Containment systems, Design, Design basis accidents, Electric power, Engineered safety systems, Environment, Financial data, Fuel densification, Nuclear fuels, Nuclear insurance, Performance, Radioactive wastes, Reactor control systems, Reactor cooling systems, Reactor instrumentation, Reactor licensing, Reactor operation, Reactor safety, Reactor sites, Seismic effects, Specifications, Waste management.

For abstract, see NSA 28 08, number 20449.

DOCKET-50270-95/GA PC$11.25/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
OCONEE NUCLEAR STATION, UNITS 2 AND 3. SAFETY EVALUATION REPORT BY DRL, JULY 6, 1973.
6 Jul 73, 181p DOCKET-50287-85

Descriptors: (*Oconee-2 reactor, *Reactor safety), (*Oconee-3 reactor, Reactor safety), Buildings, Design, Design basis accidents, Engineered safety systems, Environment, Financial data, Mechanical structures, Nuclear insurance, Radioactive wastes, Reactor control systems, Reactor cooling systems, Reactor licensing, Reactor operation, Reactor sites, Remote handling, Specifications, Spent fuel storage, Spent fuels.

For abstract, see NSA 28 08, number 20450.

DOCKET-50277-102/GA PC$3.00/MF$1.45
Philadelphia Electric CO., PA.
PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3. DRAFT ENVIRONMENTAL STATEMENT, COMMENTS OF BALTIMORE COUNTY OFFICE OF PLANNING AND ZONING, MARYLAND.
15 Jun 73, 2p DOCKET-50278-90

Descriptors: (*Peach bottom-2 reactor, *Environment), (*Peach bottom-3 reactor, Environment), Contamination, Drinking water, Lakes, Pollution, Radioactive wastes, Reactor accidents, Reactor cooling systems, Reactor licensing, Ships, Transport.

For abstract, see NSA 28 08, number 20451.

DOCKET-50277-103/GA PC$10.75/MF$1.45
Philadelphia Electric CO., PA.
PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3. TECHNICAL SPECIFICATIONS AND BASES, APPENDIX A, JULY 1973.
Jul 73, 175p DOCKET-50278-91

Descriptors: (*Peach bottom-3 reactor, *Specifications), (*Peach bottom-2 reactor, Specifications), Containment systems, Control, Cooling, Design, Electric power, Equipment protection devices, Fuel cans, Management, Radioactive materials, Reactivity, Reactor cooling systems, Reactor cores, Reactor licensing.

For abstract, see NSA 28 08, number 20452.

DOCKET-50281-116/GA PC$16.50/MF$1.45
Virginia Electric and Power CO., Richmond.
SURRY POWER STATION, UNIT 2. START-UP TEST REPORT, JULY 31, 1973.
31 Jul 73, 286p

Descriptors: (*Surry-2 reactor, *Reactor start-up), Criticality, Engineered safety systems, Equipment protection devices, Reactor licensing, Reactor operation, Testing.

For abstract, see NSA 28 08, number 20453.

DOCKET-50285-100/GA PC$7.75/MF$1.45
Omaha Public Power District, Nebr.
FORT CALHOUN STATION, UNIT 1. LICENSE APPLICATION, AMENDMENT 38, FSAR, SUPPLEMENT 20.
26 Jun 73, 114p

Descriptors: (*Calhoun-1 reactor, *Reactor safety), Containment, Fuel densification, Pipelines, Pipes, Reactor accidents, Reactor licensing, Reactor operation, Ruptures, Specifications.

For abstract, see NSA 28 08, number 20454.

DOCKET-50289-107/GA PC$4.45/MF$1.45
Metropolitan Edison CO., Reading, PA.
THREE MILE ISLAND NUCLEAR STATION, UNIT 1. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 36.
9 Feb 73, 49p

Descriptors: (*Three mile island-1 reactor, *Reactor safety), Containment, Design, Design basis accidents, Fabrication, Loss of coolant, Pipes, Pumps, Quality assurance, Reactor licensing, Reactor operation, Ruptures, Specifications, Testing, Valves.

For abstract, see NSA 28 08, number 20455.

DOCKET-50289-108/GA PC$23.50/MF$1.45
Metropolitan Edison CO., Reading, PA.
THREE MILE ISLAND NUCLEAR STATION, UNIT 1. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 41.
16 Jul 73, 428p

Descriptors: (*Three mile island-1 reactor, *Specifications), Design, Engineered safety systems, Nuclear power plants, Reactor licensing, Reactor safety, Reactor sites.

For abstract, see NSA 28 08, number 20456.

DOCKET-50289-109/GA PC$13.25/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
THREE MILE ISLAND NUCLEAR STATION, UNIT 1. SAFETY EVALUATION REPORT BY THE DIRECTORATE OF LICENSING.
11 Jul 73, 222p

Descriptors: (*Three mile island-1 reactor, *Reactor safety), Buildings, Eccs, Electric power, Engineered safety systems, Equipment protection devices, Financial data, Mechanical structures, Missile protection, Nonradioactive wastes, Nuclear insurance, Nuclear power plants, Pipelines, Pwr type reactors, Quality assurance, Radiation protection, Radioactive wastes, Reactor accidents, Reactor control systems, Reactor cooling systems, Reactor instrumentation, Reactor licensing, Reactor operation, Reactor start-up, Ruptures, Specifications, Steam, Testing, Waste management.

For abstract, see NSA 28 08, number 20457.

DOCKET-50295-139/GA PC$6.75/MF$1.45
Commonwealth Edison CO., Chicago, Ill.
ZION STATION NUCLEAR POWER PLANT, UNITS 1 AND 2. SPECIAL REPORT NO. 1, MAIN STEAM LINE CHECK VALVE MODIFICATION, SUPPLEMENT B.
2 Jul 73, 91p DOCKET-50304-105

Descriptors: (*Zion-1 reactor, *Steam lines), (*Zion-2 reactor, Steam lines), Design, Erosion, Modifications, Nondestructive testing, Performance testing, Reactor licensing, Testing, Valves.

For abstract, see NSA 28 08, number 20458.

DOCKET-50298-83/GA PC$4.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
COOPER NUCLEAR STATION. SAFETY EVALUATION REPORT, SUPPLEMENT 1, JULY 16, 1973.
16 Jul 73, 40p

Descriptors: (*Cooper reactor, *Reactor safety), Containment systems, Control systems, Eccs, Fuel rods, Gaseous wastes, Liquid wastes, Pipes, Reactor accidents, Reactor cooling systems, Reactor licensing, Reactor sites, Remote handling, Reviews, Ruptures, Storage.

For abstract, see NSA 28 08, number 20459.

DOCKET-50302-78/GA PC$3.25/MF$1.45
Florida Power Corp., St. Petersburg.
CRYSTAL RIVER NUCLEAR GENERATING PLANT, UNIT 3. RESPONSE FOR ADDITIONAL INFORMATION TO AEC'S LETTER OF MARCH 12, 1973.
1973, 23p

Descriptors: (*Crystal river-3 reactor, *Reactor sites), Buildings, Coastal waters, Mathematical models, Reactor components, Reactor licensing, Reactor safety, Reactor shutdown, Safety, Seas, Shores, Waves, Wind.

For abstract, see NSA 28 08, number 20460.

DOCKET-50302-79/GA PC$6.25/MF$1.45
Florida Power Corp., St. Petersburg.
CRYSTAL RIVER NUCLEAR GENERATING PLANT, UNIT 3. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 27.
29 Jun 73, 84p

Descriptors: (*Crystal river-3 reactor, *Reactor safety), Electric power, Engineered safety systems, Modifications, Personnel, Radiation protection, Reactor cooling systems, Reactor licensing, Reactor operation, Reactor start-up, Specifications, Testing.

For abstract, see NSA 28 08, number 20461.

DOCKET-50302-80/GA PC$9.25/MF$1.45
Gilbert Associates, Inc., Reading, PA.
CRYSTAL RIVER NUCLEAR GENERATING PLANT, UNIT 3. HURRICANE STUDY, REPORT BY GILBERT ASSOCIATES, INC., JULY 11, 1973.
11 Jul 73, 145p

Descriptors: (*Crystal river-3 reactor, *Hurricanes), Design basis accidents, Reactor licensing, Reactor safety, Reactor sites, Shores, Soils, Stability, Waves, Wind.

For abstract, see NSA 28 08, number 20462.

DOCKET-50302-81/GA PC$4.50/MF$1.45
Florida Power Corp., St. Petersburg.
CRYSTAL RIVER NUCLEAR GENERATING PLANT, UNIT 3. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 28.
16 Jul 73, 50p

Descriptors: (*Crystal river-3 reactor, *Reactor safety), Diesel engines, Floods, Mechanical structures, Reactor licensing, Scram, Shores, Steam lines, Turbines, Valves, Wind.

For abstract, see NSA 28 08, number 20463.

DOCKET-50302-82/GA PC$36.25/MF$1.45
Florida Power Corp., St. Petersburg.
CRYSTAL RIVER NUCLEAR PLANT, UNIT 3. REPORT VERIFICATION STUDY OF DAMES AND MOORE'S HURRICANE STORM SURGE MODEL WITH APPLICATION, JULY 13, 1973.
13 Jul 73, 683p

Descriptors: (*Crystal river-3 reactor, *Hurricanes), Computer calculations, Environment, Floods, Mathematical models, Reactor licensing, Reactor safety, Reactor sites, Shores, Surfaces, Wind.

For abstract, see NSA 28 08, number 20464.

DOCKET-50305-88/GA PC$13.00/MF$1.45
Wisconsin Public Service Corp., Green Bay.
KEWAUNEE NUCLEAR POWER PLANT. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 31, TECHNICAL SPECIFICATIONS, APPENDIX A.
18 Jul 73, 219p

Descriptors: (*Kewaunee reactor, *Specifications), Fabrication, Reactor licensing, Reactor operation, Reactor safety.

For abstract, see NSA 28 08, number 20465.

DOCKET-50309-117/GA PC$10.25/MF$1.45
Maine Yankee Atomic Power CO., Westboro, Mass.
MAINE YANKEE ATOMIC POWER STATION. TECHNICAL SPECIFICATIONS, APPENDIX A TO OPERATING LICENSE DPR-36.
29 Jun 73, 165p

Descriptors: (*Maine yankee reactor, *Reactor operation), Containment, Inspection, Management, Monitoring, Nuclear fuels, Reactor licensing, Reactor safety, Reactor sites, Specifications, Storage, Testing.

For abstract, see NSA 28 08, number 20466.

DOCKET-50309-118/GA PC$5.75/MF$1.45
Combustion Engineering, Inc., Windsor, Conn. Nuclear Power Dept.
MAINE YANKEE ATOMIC POWER STATION. PRECRITICAL VIBRATION MONITORING PROGRAM, FINAL REPORT, JUNE 1973.
21 Jun 73, 73p CENPD-93(Rev.1)

Descriptors: (*Maine yankee reactor, *Reactor internals), Criticality, Mechanical vibrations, Monitoring, Reactor licensing, Reactor safety.

For abstract, see NSA 28 08, number 20467.

DOCKET-50309-119/GA PC$19.70/MF$1.45
Maine Yankee Atomic Power CO., Westboro, Mass.
MAINE YANKEE ATOMIC POWER STATION. STARTUP TEST REPORT, JULY 1973.
30 Jul 73, 354p

Descriptors: (*Maine yankee reactor, *Reactor start-up), Reactor licensing, Reactor operation, Testing.

For abstract, see NSA 28 08, number 20468.

DOCKET-50315-126/GA PC$5.50/MF$1.45
Eberline Instrument Corp., Santa Fe, N. Mex. Dept. Of Nuclear Sciences.
DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2. PREOPERATIONAL ENVIRONMENTAL MONITORING REPORT, JULY 1, 1972--DECEMBER 31, 1972.
13 Jun 73, DOCKET-50316-123

Descriptors: (*Cook-1 reactor, *Environment), (*Cook-2 reactor, Environment), Air, Background radiation, Beta particles, Boreholes, Fishes, Gamma radiation, Lakes, Milk, Potassium 40, Quality control, Radiation monitoring, Reactor licensing, Reactor operation, Reactor sites, Sediments, Strontium 89, Strontium 90, Tritium, Water.

For abstract, see NSA 28 08, number 20469.

DOCKET-50315-128/GA PC$21.50/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA.
DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 45.
13 Jul 73, 386p DOCKET-50316-125

Descriptors: (*Cook-1 reactor, *Containment), (*Cook-2 reactor, Containment), Design, Ice condensers, Operation, Reactor licensing, Reactor safety, Safety.

For abstract, see NSA 28 08, number 20470.

DOCKET-50315-129/GA PC$23.45/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2. FINAL ENVIRONMENTAL STATEMENT BY THE DRL, AUGUST 1973.
Aug 73, 429p DOCKET-50316-126

Descriptors: (*Cook-1 reactor, *Environment), (*Cook-2 reactor, Environment), Biology, Cost benefit analysis, Design basis accidents, Ecology, Electric power, Geology, Ground water, Lake michigan, Meteorology, Nonradioactive wastes, Power transmission, Radioactive wastes, Reactor accidents, Reactor licensing, Reactor sites, Surface waters, Waste management.

For abstract, see NSA 28 08, number 20471.

DOCKET-50317-104/GA PC$6.00/MF$1.45
Baltimore Gas and Electric CO., MD.
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 38.
5 Jul 73, 80p DOCKET-50318-98

Descriptors: (*Calvert cliffs-1 reactor, *Fuel densification), (*Calvert cliffs-2 reactor, Fuel densification), Circuit breakers, Feedwater, Mechanical structures, Modifications, Pumps, Reactor licensing, Reactor operation, Reactor safety, Switches.

For abstract, see NSA 28 08, number 20472.

DOCKET-50321-86/GA PC$18.75/MF$1.45
Georgia Power CO., Atlanta.
EDWIN I. HATCH NUCLEAR PLANT, UNIT 1. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 36.
Jul 73, 332p

Descriptors: (*Hatch-1 reactor, *Reactor safety), Containment, Control systems, Heat exchangers, Personnel, Pipelines, Reactor control systems, Reactor cooling systems, Reactor licensing, Reactor operation, Reactor sites, Ruptures, Steam lines.

For abstract, see NSA 28 08, number 20473.

DOCKET-50324-86/GA PC$4.25/MF$1.45
Carolina Power and Light CO., Raleigh, N.C.

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 21.
26 Jul 73, 44p DOCKET-50325-86

Descriptors: (*Brunswick-1 reactor, *Reactor safety), (*Brunswick-2 reactor, Reactor safety), Diagrams, Power, Radioactive wastes, Reactor cooling systems, Reactor licensing, Reactor operation, Steam, Waste management.

For abstract, see NSA 28 08, number 20474.

DOCKET-50333-102/GA PC$5.75/MF$1.45
Power Authority of the State of New York.
JAMES A. FITZPATRICK NUCLEAR POWER PLANT. REPORT ON REACTOR PEDESTAL CRACK, JUNE 1973.
Jun 73, 74p

Descriptors: (*Fitzpatrick reactor, *Mechanical structures), Cracks, Fabrication, Pressure vessels, Reactor licensing, Reinforced concrete, Shielding, Supports.

For abstract, see NSA 28 08, number 20475.

DOCKET-50333-103/GA PC$4.50/MF$1.45
Power Authority of the State of New York.
JAMES A. FITZPATRICK NUCLEAR POWER PLANT. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 25, SUPPLEMENT 24.
17 Jul 73, 46p

Descriptors: (*Fitzpatrick reactor, *Reactor safety), Containment, Design, Pipelines, Reactor licensing, Reactor sites, Ruptures.

For abstract, see NSA 28 08, number 20476.

DOCKET-50334-80/GA PC$17.25/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
BEAVER VALLEY POWER STATION, UNIT 1. FINAL ENVIRONMENTAL STATEMENT.
Jul 73, 301p

Descriptors: (*Beaver valley-1 reactor, *Environment), Archaeology, Background radiation, Buildings, Cost benefit analysis, Design, Ecology, Electric power, Geology, Ground water, Heat transfer, Man, Meteorology, Monitoring, Nonradioactive wastes, Nuclear fuels, Power transmission, Radiation doses, Radioactive wastes, Reactor accidents, Reactor licensing, Reactor operation, Reactor sites, Steam lines, Surface waters, Transport, Turbines, Turbogenerators, Waste management.

For abstract, see NSA 28 08, number 20477.

DOCKET-50335-65/GA PC$38.50/MF$1.45
Florida Power and Light CO.
ST. LUCIE PLANT, UNIT 1. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 13.
15 Jul 73, 727p

Descriptors: (*Lucie-1 reactor, *Reactor safety), Control systems, Electric power, Hydrogen, Quality assurance, Radiation protection, Radioactive wastes, Reactor accidents, Reactor licensing, Reactor operation, Specifications, Steam, Testing, Waste management.

For abstract, see NSA 28 08, number 20478.

DOCKET-50336-67/GA PC$3.00/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 2. DEFICIENCY REPORT 4, MAY 31, 1973.
31 May 73, 3p

Descriptors: (*Millstone-2 reactor, *Electric cables), Circuit breakers, Direct current, Equipment protection devices, Failures, Reactor licensing, Scram, Testing.

For abstract, see NSA 28 08, number 20479.

DOCKET-50336-68/GA PC$8.25/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 2. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 18.
16 Jul 73, 124p

Descriptors: (*Millstone-2 reactor, *Reactor safety), Control systems, Electric power, Engineered safety systems, Reactor licensing, Reactor operation.

For abstract, see NSA 28 08, number 20480.

DOCKET-50336-69/GA PC$3.00/MF$1.45
Directorate of Regulatory Operations (Aec), Newark, N.J. Region I.
MILLSTONE NUCLEAR POWER STATION, UNIT 2. REGULATORY OPERATIONS BULLETIN 73-2, MALFUNCTION OF CONTAINMENT PURGE SUPPLY VALVE SWITCH.
18 Jul 73, 3p

Descriptors: (*Millstone-2 reactor, *Switches), Containment systems, Failures, Reactor licensing, Valves.

For abstract, see NSA 28 08, number 20481.

DOCKET-50344-66/GA PC$21.00/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
TROJAN NUCLEAR PLANT. FINAL ENVIRONMENTAL STATEMENT, AUGUST 1973.
Aug 73, 379p

Descriptors: (*Trojan reactor, *Environment), Biology, Cost benefit analysis, Ecology, Fabrication, Geology, Ground water, Mechanical structures, Meteorology, Nonradioactive wastes, Power, Power transmission, Radioactive wastes, Reactor accidents, Reactor licensing, Reactor sites, Surface waters.

For abstract, see NSA 28 08, number 20482.

DOCKET-50354-43/GA PC$25.75/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
NEWBOLD ISLAND NUCLEAR GENERATING STATION, UNITS 1 AND 2. DRAFT ENVIRONMENTAL STATEMENT.
Jul 73, 473p DOCKET-50355-43

Descriptors: (*Newbold island-1 reactor, *Environment), (*Newbold island-2 reactor, Environment), Background radiation, Ecology, Electric power, Feedwater, Geology, Heat transfer, Hydrology, Meteorology, Monitoring, Nonradioactive wastes, Power transmission, Radioactive wastes, Reactor licensing, Reactor sites, Waste management.

For abstract, see NSA 28 08, number 20483.

DOCKET-50361-44/GA PC$4.75/MF$1.45
Southern California Edison CO., Rosemead, Calif.
SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 19.
25 Jul 73, 53p DOCKET-50362-43

Descriptors: (*San onofre-2 reactor, *Reactor sites), (*San onofre-3 reactor, Reactor sites), Reactor licensing, Soils, Stability.

For abstract, see NSA 28 08, number 20484.

DOCKET-50412-24/GA PC$11.75/MF$1.45
Duquesne Light CO., Pittsburgh, PA.
BEAVER VALLEY POWER STATION, UNIT 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 8.
17 Jul 73, 192p

Descriptors: (*Beaver valley-2 reactor, *Reactor safety), Blowdown, Boron, Demisters, Explosions, Feedwater, Flow rate, Gaseous wastes, Gases, Impact shock, Liquid wastes, Ohio river, Reactor licensing, Reactor operation, Ships, Steam generators, Testing, Waste disposal.

For abstract, see NSA 28 08, number 20485.

DOCKET-50412-25/GA PC$17.75/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
BEAVER VALLEY POWER STATION, UNIT 2. FINAL ENVIRONMENTAL STATEMENT.
Jul 73, 312p

Descriptors: (*Beaver valley-2 reactor, *Environment), Archaeology, Background radiation, Cost benefit analysis, Ecology, Electric power, Geology, Ground water, Meteorology, Monitoring, Nonradioactive wastes, Power transmission, Radiation doses, Radioactive wastes, Reactor accidents, Reactor licensing, Reactor sites, Surface waters.

For abstract, see NSA 28 08, number 20486.

DOCKET-50413-34/GA PC$8.75/MF$1.45
Duke Power CO., Charlotte, N.C.
CATAWBA NUCLEAR STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 12.
20 Jul 73, 134p DOCKET-50414-34

Descriptors: (*Catawba-1 reactor, *Reactor safety), (*Catawba-2 reactor, Reactor safety), Design, Electric generators, Electric power, Engineered safety systems, Reactor components, Reactor cooling systems, Reactor licensing, Steam, Steam lines, Turbines.

For abstract, see NSA 28 08, number 20487.

DOCKET-50413-35/GA PC$7.50/MF$1.45
Duke Power CO., Charlotte, N.C.
CATAWBA NUCLEAR STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 11.
13 Jul 73, 109p DOCKET-50414-35

Descriptors: (*Catawba-1 reactor, *Reactor safety), (*Catawba-2 reactor, Reactor safety), Buildings, Calibration, Circuit breakers, Design, Diagrams, Electric generators, Electric power, Mechanical structures, Pipelines, Reactor components, Reactor licensing, Reactor operation, Scram, Valves.

For abstract, see NSA 28 08, number 20488.

DOCKET-50416-40/GA PC$7.75/MF$1.45
Mississippi Power and Light CO., Jackson (Usa).
GRAND GULF NUCLEAR STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, AMENDMENT 4.
1 Aug 73, 112p DOCKET-50417-40

Descriptors: (*Grand gulf-1 reactor, *Environment), (*Grand gulf-2 reactor, Environment), Coolants, Monitoring, Nonradioactive wastes, Radioactive wastes, Reactor licensing, Reactor operation, Reactor sites, Uses, Water.

For abstract, see NSA 28 08, number 20489.

DOCKET-50416-41/GA PC$6.50/MF$1.45
Mississippi Power and Light CO., Jackson (Usa).
GRAND GULF NUCLEAR STATION, UNITS 1 AND 2. LICENSE APPLICATION, AMENDMENT 1, JULY 27, 1973.
27 Jul 73, 86p DOCKET-50417-41

Descriptors: (*Grand gulf-1 reactor, *Financial data), (*Grand gulf-2 reactor, Financial data), Reactor licensing.

For abstract, see NSA 28 08, number 20490.

DOCKET-50423-20/GA PC$29.50/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 3. LICENSE APPLICATION, PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 6.
20 Jul 73, 549p

Descriptors: (*Millstone-3 reactor, *Reactor safety), Computer codes, Containment, Control systems, Design, Diesel engines, Electric power, Engineered safety systems, Failures, Missile protection, Pipelines, Quality assurance, Reactor cooling systems, Reactor instrumentation, Reactor internals, Reactor licensing, Ruptures, Seismic effects, Steam, Stress analysis, Valves, Ventilation, Weather.

For abstract, see NSA 28 08, number 20491.

DOCKET-50423-21/GA PC$3.50/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 3. SUGGESTED PROCEDURES REGARDING DISCRETIONARY POWERS OF THE POWER FACILITY EVALUATION COUNCIL TO ESTABLISH SPECIAL PREHEARING MEASURES.
11 Jul 73, 30p

Descriptors: (*Millstone-3 reactor, *Hearings), Legal aspects, Reactor licensing, Regulations.

For abstract, see NSA 28 08, number 20492.

DOCKET-50423-22/GA PC$28.25/MF$1.45
Millstone Point CO., Hartford, Conn.
MILLSTONE NUCLEAR POWER STATION, UNIT 3. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 7.
3 Aug 73, 525p

Descriptors: (*Millstone-3 reactor, *Reactor safety), Control systems, Design, Electric power, Engineered safety systems, Reactor control systems, Reactor instrumentation, Reactor licensing, Steam.

For abstract, see NSA 28 08, number 20493.

DOCKET-50424-19/GA PC$18.75/MF$1.45
Georgia Power CO., Atlanta.
ALVIN W. VOGTLE NUCLEAR PLANT, UNITS 1, 2, 3, AND 4. PRELIMINARY SAFETY ANALYSIS REPORT; LICENSE APPLICATION, AMENDMENT 4.
10 Jul 73, 332p DOCKET-50425-19, DOCKET-50426-19

Descriptors: (*Vogtle-1 reactor, *Reactor safety), (*Vogtle-2 reactor, Reactor safety), (*Vogtle-3 reactor, Reactor safety), (*Vogtle-4 reactor, Reactor safety), Cooling towers, Diesel engines, Eccs, Electric batteries, Electric cables, Engineered safety systems, Environment, Equipment protection devices, Feedwater, Loss of coolant, Pumps, Reactor cooling systems, Reactor licensing, Reactor shutdown, Rhr systems, Seismic effects, Size, Steam lines, Valves.

For abstract, see NSA 28 08, number 20494.

DOCKET-50424-20/GA PC$9.75/MF$1.45
Georgia Power CO., Atlanta.
ALVIN W. VOGTLE NUCLEAR PLANT, UNITS 1, 2, 3, AND 4. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 5.
27 Jul 73, 153p DOCKET-50425-20, DOCKET-50426-20

Descriptors: (*Vogtle-1 reactor, *Reactor safety), (*Vogtle-2 reactor, Reactor safety), (*Vogtle-3 reactor, Reactor safety), (*Vogtle-4 reactor, Reactor safety), Control rod drives, Design, Gaseous wastes, Liquid wastes, Pipes, Quality assurance, Radiation protection, Reactor cooling systems, Reactor licensing, Reactor sites, Ruptures, Safety, Waste disposal.

For abstract, see NSA 28 08, number 20495.

DOCKET-50424-21/GA PC$9.30/MF$1.45
Directorate of Licensing (Aec), Washington, D.C.
ALVIN W. VOGTLE NUCLEAR PLANT, UNITS 1, 2, 3, AND 4. DRAFT ENVIRONMENTAL STATEMENT BY THE DRL, AUGUST 1973.
Aug 73, 146p DOCKET-50425-21, DOCKET-50426-21

Descriptors: (*Vogtle-1 reactor, *Environment), (*Vogtle-2 reactor, Environment), (*Vogtle-3 reactor, Environment), (*Vogtle-4 reactor, Environment), Archaeology, Background radiation, Cost benefit analysis, Design basis accidents, Ecology, Electric power, Geology, Ground water, Heat transfer, Hydrology, Man, Monitoring, Nonradioactive wastes, Power transmission, Radiation doses, Radioactive wastes, Reactor accidents, Reactor licensing, Reactor sites, Seismology, Surface waters.

For abstract, see NSA 28 08, number 20496.

DOCKET-50438-11/GA PC$34.75/MF$1.45
Tennessee Valley Authority, Chattanooga.
BELLEFONTE NUCLEAR PLANT, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 1.
12 Jul 73, 654p DOCKET-50439-11

Descriptors: (*Bellefonte-1 reactor, *Environment), (*Bellefonte-2 reactor, Environment), Control systems, Design, Electric power, Engineered safety systems, Quality assurance, Radioactive wastes, Reactor control systems, Reactor instrumentation, Reactor licensing, Reactor safety, Reactor sites, Specifications, Steam, Waste management.

For abstract, see NSA 28 08, number 20497.

DOCKET-50440-17/GA PC$39.25/MF$1.45
Cleveland Electric Illuminating CO., Ohio.
PERRY NUCLEAR POWER PLANT, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 1.
18 Jul 73, 743p DOCKET-50441-17

Descriptors: (*Perry-1 reactor, *Reactor safety), (*Perry-2 reactor, Reactor safety), Containment systems, Design, Eccs, Electrical equipment, Electronic equipment, Engineered safety systems, Environment, Gaseous wastes, Geography, Geology, Hydrology, Meteorology, Missile protection, Nuclear fuels, Radioactive wastes, Reactor accidents, Reactor cooling systems, Reactor licensing, Reactor operation, Reactor shutdown, Reactor sites, Remote handling, Seismology, Shielding, Storage, Ventilation, Waste management.

For abstract, see NSA 28 08, number 20498.

DOCKET-50443-1/GA PC$30.25/MF$1.45
Public Service CO. Of New Hampshire, Seabrook (Usa).
SEABROOK STATION, UNITS 1 AND 2. LICENSE APPLICATION AND GENERAL INFORMATION, VOLUME 1.
30 Mar 73, 563p DOCKET-50444-1

Descriptors: (*Seabrook-1 reactor, *Financial data), (*Seabrook-2 reactor, Financial data), Cost, Electric power, Legal aspects, Liabilities, Reactor licensing, Reactor operation.

For abstract, see NSA 28 08, number 20499.

DOCKET-50443-10/GA PC$20.50/MF$1.45
Public Service CO. Of New Hampshire, Seabrook (Usa).
SEABROOK STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 5.
Jun 73, 366p DOCKET-50444-10

Descriptors: (*Seabrook-1 reactor, *Reactor safety), (*Seabrook-2 reactor, Reactor safety), Design, Education, Electric generators, Gaseous wastes, Liquid wastes, Monitoring, Personnel, Planning, Radiation protection, Radioactive wastes, Reactor licensing, Shielding, Solid wastes, Steam lines, Turbines, Ventilation, Waste management.

For abstract, see NSA 28 08, number 20507.

DOCKET-50443-11/GA PC$19.25/MF$1.45
Public Service CO. Of New Hampshire, Seabrook (Usa).
SEABROOK STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 6.
Jun 73, 342p DOCKET-50444-11

Descriptors: (*Seabrook-1 reactor, *Reactor safety), (*Seabrook-2 reactor, Reactor safety), Engineered safety systems, Quality assurance, Radiation protection, Radioactive wastes, Reactor accidents, Reactor components, Reactor cooling systems, Reactor licensing, Reactor operation, Specifications, Testing, Waste management.

For abstract, see NSA 28 08, number 20508.

DOCKET-50443-2/GA PC$31.25/MF$1.45
Public Service CO. Of New Hampshire, Seabrook (Usa).
SEABROOK STATION, UNITS 1 AND 2. LICENSE APPLICATION AND GENERAL INFORMATION, VOLUME 2.
30 Mar 73, 583p DOCKET-50444-2

Descriptors: (*Seabrook-1 reactor, *Antitrust review), (*Seabrook-2 reactor, Antitrust review), Electric power, Fabrication, Production, Reactor licensing.

For abstract, see NSA 28 08, number 20500.

DOCKET-50443-3/GA PC$28.00/MF$1.45
Public Service CO. Of New Hampshire, Seabrook (Usa).
SEABROOK STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, VOLUME 1.
Jun 73, 519p DOCKET-50444-3

Descriptors: (*Seabrook-1 reactor, *Environment), (*Seabrook-2 reactor, Environment), Background radiation, Ecology, Geology, Heat transfer, Hydrology, Meteorology, Nonradioactive wastes, Power transmission, Radioactive materials, Radioactive wastes, Reactor licensing, Reactor safety, Reactor sites.

For abstract, see NSA 28 08, number 20501.

DOCKET-50443-4/GA PC$26.75/MF$1.45
Public Service CO. Of New Hampshire, Seabrook (Usa).
SEABROOK STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, VOLUME 2.
Jun 73, 494p DOCKET-50444-4

Descriptors: (*Seabrook-1 reactor, *Environment), (*Seabrook-2 reactor, Environment), Cost benefit analysis, Design, Fabrication, Monitoring, Radioactive wastes, Reactor licensing, Reactor operation, Reactor sites.

For abstract, see NSA 28 08, number 20502.

DOCKET-50443-5/GA PC$26.50/MF$1.45
Public Service CO. Of New Hampshire, Seabrook (Usa).

SEABROOK STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, VOLUME 3.
Jun 73, 490p DOCKET-50444-5

Descriptors: (*Seabrook-1 reactor, *Environment), (*Seabrook-2 reactor, Environment), Amphibians, Birds, Botany, Design, Electric power, Jets, Mammals, Meteorology, Planning, Reactor licensing, Reactor sites, Reptiles, Thermal pollution, Water.

For abstract, see NSA 28 08, number 20503.

DOCKET-50443-6/GA PC$20.00/MF$1.45
Public Service CO. Of New Hampshire, Seabrook (Usa).
SEABROOK STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 1.
Jun 73, 353p DOCKET-50444-6

Descriptors: (*Seabrook-1 reactor, *Reactor safety), (*Seabrook-2 reactor, Reactor safety), Design, Geography, Industry, Meteorology, Reactor sites, Transport.

For abstract, see NSA 28 07, number 17636.

DOCKET-50443-7/GA PC$30.00/MF$1.45
Public Service CO. Of New Hampshire, Seabrook (Usa).
SEABROOK STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 2.
Jun 73, 558p DOCKET-50444-7

Descriptors: (*Seabrook-1 reactor, *Reactor safety), (*Seabrook-2 reactor, Reactor safety), Boreholes, Earthquakes, Geology, Hydrology, Meteorology, Reactor licensing, Reactor sites, Rocks, Seismic effects, Seismology.

For abstract, see NSA 28 08, number 20504.

DOCKET-50443-8/GA PC$19.25/MF$1.45
Public Service CO. Of New Hampshire, Seabrook (Usa).
SEABROOK STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 3.
Jun 73, 342p DOCKET-50444-8

Descriptors: (*Seabrook-1 reactor, *Reactor safety), (*Seabrook-2 reactor, Reactor safety), After-heat removal, Design, Eccs, Electrical equipment, Electronic equipment, Fires, Floods, Missile protection, Pipelines, Reactivity, Reactor components, Reactor control systems, Reactor cooling systems, Reactor licensing, Ruptures, Seismic effects, Wind.

For abstract, see NSA 28 08, number 20505.

DOCKET-50443-9/GA PC$25.50/MF$1.45
Public Service CO. Of New Hampshire, Seabrook (Usa).
SEABROOK STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, VOLUME 4.
Jun 73, 468p DOCKET-50444-9

Descriptors: (*Seabrook-1 reactor, *Reactor safety), (*Seabrook-2 reactor, Reactor safety), Air conditioning, Containment, Cooling, Data display systems, Design, Eccs, Electric power, Engineered safety systems, Feedwater, Heating, Nuclear fuels, Reactor control systems, Reactor licensing, Reactor shutdown, Scram, Storage, Ventilation.

For abstract, see NSA 28 08, number 20506.

FIND-50286(7-73)/GA PC$4.00/MF$1.45
Technical Information Center (Aec), Oak Ridge, Tenn.
FIND: INDIAN POINT STATION, UNIT 3.
H. D. Raleigh. Jul 73, 38p

Descriptors: (*Indian point-3 reactor, *Reactor safety), Bibliographies, Indexes.

For abstract, see NSA 28 07, number 17502.

TID-26300/GA PC$7.60/MF$1.45
Technical Information Center (Aec), Oak Ridge, Tenn.
ISSUANCES OF THE ATOMIC ENERGY COMMISSION AND THE ATOMIC SAFETY AND LICENSING BOARDS, JULY--DECEMBER 1972.
Jul 73, 256p

Descriptors: (*Us aec, *Reactor licensing), Legal aspects, Regulations.

For abstract, see NSA 28 07, number 17639.

18F. Radiation Shielding and Protection

AD-768 493/9GA PC$3.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
FAST-NEUTRON TRANSPORT IN SHIELDS HAVING LIMITED TRANSVERSE DIMENSIONS,
L. P. Bass, G. M. Bozin, T. A. Germogenova, S. F. Degyarev, and A. P. Suvorov. 9 Oct 73, 21p Rept no. FTD-HT-23-854-73
Edited trans. of Voprosy Fiziki Zashchity Reaktorov (USSR) n5 p112-122 1972, by John A. Miller.

Descriptors: (*Neutron transport theory, *Shielding), Neutron flux, Numerical analysis, USSR, Fast neutrons.
Identifiers: Translations.

In this paper the authors discuss results of experiments on the spatial, angular, and energy distributions of a fast-neutron flux in cylindrical specimens made of boron carbide, lithium hydride, aluminum, iron, and lead.

CONF-730546-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
RADIOACTIVE MATERIAL SHIPPING PACKAGES: THEIR DESIGN AND SAFETY ANALYSIS.
L. B. Shappert. 12p

Descriptors: (*Casks, *Design), (*Radioactive materials, *Transport), Fuel cycle, Safety, Testing.

For abstract, see NSA 28 07, number 16154.

CONF-730619-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
STUDIES OF SENSITIVITY OF SHIELD PERFORMANCE TO NUCLEAR DATA VARIATIONS.
F. C. Maienschein. 1972, 20p

Descriptors: (*Shielding, *Performance), Cross sections, Data, Iron, Kernels, Neutron reactions, Perturbation theory, Sensitivity, Sodium, Variations.

For abstract, see NSA 28 08, number 20180.

JAPFNR-106/GA PC$9.25/MF$1.45
Ministry of Construction, Tokyo (Japan). Building Research Inst.
VIBRATION TEST FOR GRAPHITE SHIELDING STRUCTURE.
Mar 72, 144p PNC-J-290-72-1
U.S. Sales Only.

Descriptors: (*Fbr type reactors, Shielding), (*Shielding, *Seismic effects), Configuration, Graphite, Mechanical vibrations, Mockup, Supports, Testing.

For abstract, see NSA 28 07, number 17428.

N-73-11694/GA PC$4.00/MF$1.45
General Electric CO., Philadelphia, PA. Missile and Space Div.
MANNED SPACE FLIGHT NUCLEAR SYSTEM SAFETY. VOLUME 1. BASE NUCLEAR SYSTEM SAFETY. FINAL REPORT.
Jan 72, 44p NASA-CR-123842
Contract NAS8-26283

Descriptors: (*Space power reactors, *Reactor safety), (*Snap reactors, Reactor safety), Launching, Man, Personnel, Radiation hazards, Radiation protection, Reentry, Space flight, Space vehicles.

For abstract, see NSA 28 07, number 17508.

N-73-11703/GA PC$5.45/MF$1.45
General Electric CO., Philadelphia, PA. Missile and Space Div.
MANNED SPACE FLIGHT NUCLEAR SYSTEM SAFETY. VOLUME 6. SPACE BASE NUCLEAR SYSTEM SAFETY PLAN. FINAL REPORT.
Jan 72, 72p
Contract NAS8-26283

Descriptors: (*Space power reactors, *Radiation protection), (*Snap reactors, Radiation protection), Personnel, Reactor safety, Recommendations, Regulations, Space flight.

For abstract, see NSA 28 07, number 17515.

ORNL-RSIC-36/GA PC$11.25/MF$1.45
Oak Ridge National Lab., Tenn.
SHIELDING AGAINST INITIAL RADIATIONS FROM NUCLEAR WEAPONS.
L. S. Abbott. Jul 73, 181p
Contract W-7405-eng-26

Descriptors: (*Gamma radiation, *Shielding), (*Neutrons, Shielding), (*Nuclear weapons, *Radiation hazards), Discrete ordinates, Monte carlo method.

For abstract, see NSA 28 08, number 20181.

ORNL-tr-2670/GA PC$3.00/MF$1.45
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Serpukhov. Institut Fiziki Vysokikh Energii.
PROPAGATION OF RADIATION THROUGH LABYRINTHS OF THE 70-GEV SYNCHROTRON.
V. E. Borodin, L. P. Obryashikova, and M. N. Chimankov. 1971, 8p
Translation of IFVE-ORE--71-84.

Descriptors: (*Serpukhov synchrotron, *Shielding), Flux density, Nucleons.

For abstract, see NSA 28 08, number 18983.

RT/FI-(73)2/GA PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
SHIELDING PROBLEMS IN THE PEC REACTOR.
U. Canali, G. Cicognani, N. Corbo, U. Farinelli, and R. Nicks. 24 Jan 73, 18p CONF-721018-25, RVI-PEC-672
U.S. Sales Only.

Descriptors: (*Pec brasimone reactor, *Shielding), Computer calculations, Design, Geometry.

For abstract, see NSA 28 07, number 17434.

18G. Radioactive Wastes and Fission Products

AECL-3037(Pt.2)/GA PC$5.50/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
FISSION PRODUCT DATA FOR THERMAL REACTORS. PART II. YIELDS.
W. H. Walker. Apr 73, 68p
U.S. Sales Only.

Descriptors: (*Uranium 233, *Neutron reactions), (*Uranium 235, Neutron reactions), (*Plutonium 239, Neutron reactions), (*Plutonium 241, Neutron reactions), Fission products, Fission yield, Thermal fission, Thermal neutrons.

For abstract, see NSA 28 08, number 19956.

BNL-17978/GA PC$3.25/MF$1.45
Brookhaven National Lab., Upton, N. Y.
CONCRETE-POLYMER COMPOSITE MATERIALS AND ITS POTENTIAL FOR CONSTRUCTION, URBAN WASTE UTILIZATION AND NUCLEAR WASTE STORAGE.
M. Steinberg. May 73, 24p

Descriptors: (*Radioactive wastes, *Storage), (*Composite materials, *Uses), (*Concretes, Uses), (*Polymers, Uses), Compression, Creep, Mechanical properties, Solid wastes, Stability, Waste storage.

For abstract, see NSA 28 08, number 18896.

CEA-R-4444/GA PC$7.50/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
COATING OF ALUMINUM RESIDUES CONTAINING FISSION PRODUCT FLUORIDES.
P. Labe. Apr 73, 106p
U.S. Sales Only.

Descriptors: (*Radioactive waste processing, *Solid wastes), (*Aluminium oxides, Radioactive waste processing), Coatings, Fission products, Fluoride volatility process, Fluorides, Glass, Radioactive waste disposal, Residues, Spent fuels.

For abstract, see NSA 28 07, number 15401.

CONF-730919-1/GA PC$3.50/MF$1.45
Oak Ridge National Lab., Tenn.
SITE INVESTIGATIONS FOR A BEDDED SALT PILOT PLANT IN THE PERMIAN BASIN.
T. F. Lomenick, and A. L. Boch. 1973, 26p

Descriptors: (*Radioactive waste disposal, *Salt deposits), Geology, Site selection.

For abstract, see NSA 28 08, number 18918.

EUR-4981/GA PC$3.50/MF$1.45
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
RADIOACTIVE POLLUTION: ITS ELIMINATION. PART II. RADIOACTIVE WASTES PROCESSING PLANTS.
G. Mosselmans, and J. Vaccarezza. Jun 73, 27p
In French. U.S. Sales Only.

Descriptors: Decontamination, Liquid wastes, Radioactive waste processing, Solid wastes, Waste storage.

For abstract, see NSA 28 08, number 18062.

JAERI-M-5089/GA PC$4.00/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
RADIOACTIVE WASTE MANAGEMENT IN TOKAI RESEARCH ESTABLISHMENT, JAERI.
Jan 73, 33p
In Japanese. U.S. Sales Only.

Descriptors: (*Radioactive waste processing, *Japan), (*Waste storage, Japan), Evaporation, Flocculation, Ion exchange, Liquid wastes, Radioactive wastes, Solid wastes, Transport.

For abstract, see NSA 28 08, number 18919.

LA-UR-73-1001/GA PC$3.25/MF$1.45
Los Alamos Scientific Lab., N. Mex.
ECODISTRIBUTION OF PLUTONIUM IN LIQUID WASTE DISPOSAL AREAS AT LOS ALAMOS.
T. E. Hakonson, L. J. Johnson, and W. H. Purtymun. 1973, 23p CONF-730907-4

Descriptors: (*Tritium, *Radioecological concentration), (*Cesium 137, Radioecological concentration), (*Plutonium 238, Radioecological concentration), (*Plutonium 239, Radioecological concentration), Gamma spectroscopy, Grass, Liquid scintillation detectors, Liquid wastes, Los alamos scientific lab, Radiation monitoring, Radioactive waste disposal, Radioactive wastes, Rodents, Sampling, Sediments, Shrubs, Trees, Water.

For abstract, see NSA 28 08, number 18231.

LA-tr-73-11/GA PC$3.50/MF$1.45
FISSION PRODUCT DATA LIBRARY.
C. Devillers, J. Blachot, M. Lott, B. Nimal, and 1973, 30p CONF-730302-13
Translation of SM--170/63.

Descriptors: (*Fission products, *Data), (*Fuel elements, *Radioactivity).

For abstract, see NSA 28 07, number 16979.

N-73-17718/GA PC$5.45/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
FISSION-GAS RELEASE FROM URANIUM NITRIDE AT HIGH-FISSION-RATE DENSITY.
M. B. Weinstein, T. A. Kirchgessner, and T. N. Tambling. Mar 73, 57p NASA-TN-D-7171

Descriptors: (*Uranium nitrides, *Physical radiation effects), (*Fission products, *Gases), (*Nuclear fuels, Physical radiation effects), Burnup, Diffusion, Neutrons, Very high temperature.

For abstract, see NSA 28 08, number 18602.

N-73-18675/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
TESTING OF URANIUM NITRIDE FUEL IN T-111 CLADDING AT 1200K CLADDING TEMPERATURE.
R. G. Rohal, T. N. Tambling, and R. L. Smith. Mar 73, 26p NASA-TM-X-2732

Descriptors: (*Uranium nitrides, *Physical radiation effects), (*Fuel pins, Physical radiation effects), (*Tantalum alloy-t111, Physical radiation effects), Burnup, Embrittlement, Fuel cans, Irradiation, Neutrons, Performance.

For abstract, see NSA 28 08, number 18604.

ORNL-TM-3619/GA PC$4.75/MF$1.45
Oak Ridge National Lab., Tenn.
ECOLOGICAL-ENVIRONMENTAL ASSESSMENTS RELATED TO THE FEDERAL REPOSITORY.
R. C. Dahlman, and Y. Tanaka. Jul 73, 53p
Contract W-7405-eng-26

Descriptors: (*Radioactive waste disposal, *Site selection), (*Kansas, Terrestrial ecosystems), (*Terrestrial ecosystems, *Radionuclide migration), (*Strontium 90, *Radioecological concentration), Animals, Food chains, Forage, Grass, Human populations, Radionuclide kinetics, Rural populations, Soils, Thermal effluents, Thermal pollution, Waste heat, Wheat.

For abstract, see NSA 28 07, number 15494.

ORNL-TM-4249/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
DESIGN OF A SYSTEM FOR THE NON-DESTRUCTIVE ASSAY OF EXP 233 U IN WASTE DRUMS.
V. A. DeCarlo. Aug 73, 20p
Contract W-7405-eng-26

Descriptors: (*Uranium 233, *Radiometric analysis), (*Radioactive wastes, *Chemical analysis), Gamma spectroscopy, Liquid wastes, Nondestructive analysis, Quantitative chemical analysis.

For abstract, see NSA 28 08, number 17912.

ORNL-tr-2684-B/GA PC$4.25/MF$1.45
DISPOSAL OF RADIOACTIVE WASTES FROM NUCLEAR POWER PLANTS. PART 2. APPENDICES. FINAL REPORT FOR THE PERIOD JANUARY 1, 1970--DECEMBER 31, 1971.
H. Witte, J. Herzog, and R. Christ. 45p
Translated from a German report.

Descriptors: (*Water cooled reactors, *Radioactive waste disposal), (*Bitumens, Radioactive waste disposal), (*Radioactive waste processing, *Solidification), Economics, Transport.

For abstract, see NSA 28 07, number 16148.

RFP-2004-A/GA PC$4.00/MF$1.45
Dow Chemical U.S.a., Golden, Colo. Rocky Flats Div.
CHEMISTRY RESEARCH AND DEVELOPMENT. RESEARCH AND ECOLOGY SEMIANNUAL PROGRESS REPORT, JULY--DECEMBER 1972.
W. C. Bright, D. R. Cartwright, J. D. Moseley, and E. Vejvoda. 16 May 73, 32p
Contract AT(29-1)-1106

Descriptors: (*Radioactive waste processing, *Research programs), (*Radiation monitoring, Research programs), (*Plutonium, *Chemistry), Fabrication, Foils, Separation processes, Storage.

For abstract, see NSA 28 07, number 15402.

SLA-73-575/GA PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
WASTE HEAT MELT PROGRAM.
H. C. Hardee, and W. N. Sullivan. Jul 73, 23p

Descriptors: (*Radioactive waste disposal, *Underground disposal), (*Waste heat, *Melting), Cavities, Heating, Integral equations.

For abstract, see NSA 28 08, number 18921.

18H. Radioactivity

AD-768 414/5GA PC$3.75/MF$1.45
Science Applications Inc La Jolla Calif
USER'S GUIDE TO VERSION 2 OF ATR (AIR TRANSPORT OF RADIATION).
Topical rept.,
Louis Huszar, Lonnie J. Nesseler, and William A. Woolson. Apr 73, 92p Rept no. SAI-73-534-LJ
DNA-3144Z
Contract DASA01-70-C-0090

Descriptors: (*Nuclear radiation, Air), (*Programming(Computers), Instruction manuals), Neutron flux, Gamma rays, X rays, Computer programs.
Identifiers: ATR computer code, UNIVAC 1108 computers, FORTRAN.

The document is intended to serve as a user's manual for Version 2 of the ATR computer program. ATR (derived from Air Transport of Radia-

tion) provides accurate, inexpensive and easily understood solutions to radiation environment problems at all altitudes in the atmosphere with a simple set of input commands. ATR contains parametric models of a comprehensive data base of air transport results generated by discrete ordinates techniques. The data base was generated for neutrons, secondary gamma rays, prompt gamma rays, and x-rays as a function of source energy, range, detector energy, and angle to a distance of 550 g/square cm of infinite, homogeneous air. Results at all combinations of distance and density are obtained by integral mass scaling upon infinite, homogeneous air results. Effects of the interface between air and ground and of nonuniform air density are treated as perturbation corrections. ATR resides in less than 54k of core on the Univac 1108, uses no peripheral storage, functions effectively in a time-sharing environment, and typically uses less than a single computational second per problem. (Author)

DOCKET-700371-2/GA PC$11.00/MF$1.45
United Nuclear Corp., New Haven, Conn.
NAVAL PRODUCTS DIVISION. ENVIRONMENTAL REPORT, REVISED (7-23-73).
23 Jul 73, 176p

Descriptors: (*Fuel fabrication plants, *Environment), Accidents, Gaseous wastes, Licensing, Liquid wastes, Radiation monitoring, Radioactive waste diaposal, Radioactive waste processing, Solid wastes, Waste disposal, Waste heat, Waste processing.

For abstract, see NSA 28 08, number 18243.

ITJ-30/GA PC$5.50/MF$1.45
Institute of Nuclear Techniques, Krakow (Poland).
ABSORPTION OF THE GAMMA RADIATION IN INHOMOGENEOUS MEDIA.
J. Gyurcsak, and Nov 72, 66p
U.S. Sales Only.

Descriptors: (*Gamma radiation, *Absorption), Kev range 10-100, Monte carlo method, Iron oxides, Water, Barium sulfates, Boric acid.

For abstract, see NSA 28 08, number 20136.

ITJ-36/GA PC$4.25/MF$1.45
Institute of Nuclear Techniques, Krakow (Poland).
LIQUID SCINTILLATION MEASUREMENTS OF NATURAL TRITIUM IN WATER SAMPLES.
T. Florkowski, and J. Grabczak. Mar 73, 43p
In Polish. U.S. Sales Only.

Descriptors: (*Water, *Chemical analysis), (*Tritium, *Radiometric analysis), Electrolysis, Liquid scintillation detectors, Quantitative chemical analysis.

For abstract, see NSA 28 08, number 17910.

LA-4037-SOP(Rev.)(Suppl.1)/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
PAJARITO PLAN FOR RADIATION EMERGENCY.
H. C. Paxton. May 73, 4p
Contract W-7405-eng-36

Descriptors: (*Radiation accidents, *Planning), Criticality, Fissile materials, Materials handling, Radiation hazards, Radiation monitors, Remote handling.

For abstract, see NSA 28 07, number 15463.

PRNC-163/GA PC$5.25/MF$1.45
Puerto Rico Nuclear Center, Mayaguez.
EXPERIMENTAL DETERMINATION OF ABSORBED GAMMA DOSES IN LEAD CYLINDERS.
A. E. Gileadi, and L. Griffin. Apr 73, 62p
Contract AT(40-1)-1833
In Spanish. U.S. Sales Only.

Descriptors: (*Gamma radiation, *Radiation doses), (*Lead, Radiation doses), Boundary conditions, Cylinders, Heating.

For abstract, see NSA 28 08, number 20141.

RT/PROT-(72)44/GA PC$3.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
RADIOACTIVE CONTAMINATION AND CLASSIFICATION OF GROUND-WATER.
A. A. Cigna. 5p CONF-701236-1
In Italian. U.S. Sales Only.

Descriptors: (*Ground water, *Contamination), Drinking water, Environment, Human populations, Hydrology, Liquid wastes, Nonradioactive waste disposal, Radioactive waste disposal, Radioecological concentration, Radionuclide migration, Soils, Uses, Water pollution.

For abstract, see NSA 28 07, number 15488.

18I. Reactor Engineering and Operation

AEC-tr-7431/GA PC$4.00/MF$1.45
PROBLEMS OF SODIUM REMOVAL AND DEACTIVATION OF FAST REACTOR CIRCUITS AND COMPONENTS.
V. M. Arkhipov, V. N. Ivanenko, B. S. Tymosh, and V. M. Shirin. 1973, 10p
Translation of Nekotoryye voprosy otmyvki ot natriya i oborudovaniya konturov reaktorov na bystrykh neytronakh.

Descriptors: (*Fbr type reactors, Primary coolant circuits), (*Sodium cooled reactors, Primary coolant circuits), (*Reactor components, *Cleaning), (*Primary coolant circuits, Cleaning), Decontamination, Sodium.

For abstract, see NSA 28 08, number 20283.

AECL-4449/GA PC$3.25/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
STEAM GENERATOR TUBE FAILURES: A WORLD SURVEY OF WATER-COOLED NUCLEAR POWER REACTORS TO THE END OF 1971.
P. D. Stevens-Guille. Apr 73, 25p
U.S. Sales Only.

Descriptors: (*Water cooled reactors, Steam generators), (*Steam generators, *Failures), Corrosion, Leak detectors, Leaks, Repair, Reviews, Tubes.

For abstract, see NSA 28 08, number 20370.

AECL-4450/GA PC$6.00/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
FORCED CONVECTIVE HEAT TRANSFER TO SUPERHEATED STEAM IN ROD BUNDLES.
D. C. Groeneveld. Apr 73, 78p
U.S. Sales Only.

Descriptors: (*Steam cooled reactors, *Heat transfer), (*Fuel element clusters, Heat transfer), Fluid flow, Forced convection, Fuel channels.

For abstract, see NSA 28 08, number 20227.

AEEW-R-844/GA PC$3.50/MF$1.45
Atomic Energy Establishment, Winfrith (England).
DESIGN AND MANUFACTURE OF SODIUM-FILLED CALANDRIA FOR USE IN ZERO POWER FAST REACTORS.
R. K. Hilton, G. R. Jamieson, P. Mason, and I. Waltham. Dec 72, 26p
U.S. Sales Only.

Descriptors: (*Zero power reactors, Calandrias), (*Fast reactors, Calandrias), (*Calandrias, *Design), Fabrication, Fuel pins, Mockup, Sodium, Stainless steels, Testing, Welding, Welding machines, Zebra reactor.

For abstract, see NSA 28 07, number 17456.

AEEW-R-867/GA PC$3.50/MF$1.45
Atomic Energy Establishment, Winfrith (England).
CALCULATION AND USE OF SPATIAL TRANSFER FUNCTIONS FOR THE CONTROL ANALYSIS OF XENON-INDUCED TRANSIENT PHENOMENA.
D. H. Owens. May 73, 28p
U.S. Sales Only.

Descriptors: (*Reactor control systems, *Transients), Cylindrical configuration, Oscillations, Poisoning, Power, Power reactors, Reactor kinetics, Reactor kinetics equations, Reactor operation, Reactor stability, Space dependence, Spatial distribution, Time dependence, Transfer functions, Xenon.

For abstract, see NSA 28 08, number 20408.

ANCR-1101/GA PC$3.50/MF$1.45
Idaho Nuclear Corp., Idaho Falls.
TEST AND ANALYSIS OF TRA SEISMIC SCRAM SWITCHES.
S. J. Gold. Jul 68, 28p
Contract AT(10-1)-1230

Descriptors: (*Atr reactor, *Safety engineering), (*Etr reactor, Safety engineering), (*Mtr reactor, Safety engineering), Configuration, Earthquakes, Performance testing, Scram, Seismic effects, Switches.

For abstract, see NSA 28 07, number 17457.

BARC-655/GA PC$3.50/MF$1.45
Bhabha Atomic Research Centre, Bombay (India).
WATER CHEMISTRY STUDIES. XI. PH MAINTENANCE IN NUCLEAR REACTOR WATER SYSTEMS: A COMPARATIVE ASSESSMENT.
G. Venkateswaran, S. S. Prasad, and K. S. Venkateswarlu. 1973, 29p
U.S. Sales Only.

Descriptors: (*Coolants, *Ph value), (*Water cooled reactors, Coolants), Amines, Ammonium hydroxides, Comparative evaluations, Lithium hydroxides, Morpholines, Resins, Water.

For abstract, see NSA 28 07, number 15265.

BNWL-SA-4734/GA PC$4.50/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
TORNADO RESISTANT DESIGN.
T. L. Anderson. Jun 73, 48p CONF-730640-1

Descriptors: (*Nuclear power plants, *Safety engineering), (*Mechanical structures, Safety engineering), Design, Missiles, Wind.

For abstract, see NSA 28 08, number 20341.

CONF-730819-1/GA PC$3.25/MF$1.45
Oak Ridge National Lab., Tenn.

REVIEW OF 1972 SAFETY-RELATED OCCURRENCES IN NUCLEAR REACTOR POWER PLANTS.
R. L. Scott. 21p

Descriptors: (*Reactor safety, *Reviews), (*Bwr type reactors, *Accidents), (*Pwr type reactors, Accidents), Reactor accidents.

For abstract, see NSA 28 08, number 20343.

CONF-730904-1/GA PC$3.25/MF$1.45
Oak Ridge National Lab., Tenn.
NUCLEAR DESALINATION PLANT CONTROL STUDIES.
S. J. Ball, N. E. Jr. Clapp, and J. G. Delene. 21 Mar 73, 21p
Contract W-7405-eng-26

Descriptors: (*Pwr type reactors, Reactor control systems), (*Desalination reactors, Reactor control systems), (*Reactor control systems, *Simulation), Computer calculations, Desalination, Digital computers, Seawater.

For abstract, see NSA 28 07, number 17614.

COO-2244-1(Rev.1)/GA PC$7.25/MF$1.45
Combustion Engineering, Inc., Windsor, Conn. Nuclear Power Dept.
STEAM--WATER MIXING TEST PROGRAM. TASK D: FORMAL REPORT FOR TASK A, 1/5 SCALE BROKEN LOOP.
P. A. Lowe, J. R. Brodrick, and W. E. Burchill. Mar 73, 104p CENPD-65(Rev.1)
Contract AT(11-1)-2244

Descriptors: (*Pwr type reactors, *Loss of coolant), Eccs, Hydraulics, Mixing, Mockup, Pressure dependence, Steam, Testing, Water.

For abstract, see NSA 28 07, number 17501.

COO-3019-4/GA PC$4.75/MF$1.45
Harvard Univ., Boston, Mass. Harvard Air Cleaning Lab.
SEMIANNUAL PROGRESS REPORT, SEPTEMBER 1--DECEMBER 31, 1972.
D. W. Underhill, R. R. Hall, A. Gold, A. Goldin, and M. W. First. Feb 73, 53p
Contract AT(11-1)-3019

Descriptors: (*Fftf reactor, *Cover gas), (*Sodium oxides, *Deposits), (*Argon 41, *Adsorption), (*Aerosols, *Chemical analysis), Charcoal, Filters, Heat exchangers, Heat transfer, Tubes, Nitrogen, Sodium carbonates.

For abstract, see NSA 28 08, number 20308.

DP-MS-73-27/GA PC$3.75/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S. C. Savannah River Lab.
ESTABLISHING SUBCRITICAL LIMITS.
H. K. Clark. 33p
Contract AT(07-2)-1

Descriptors: (*Criticality, *Plutonium 239), Aqueous solutions, Control, Critical mass, Safety, Standards.

For abstract, see NSA 28 08, number 18925.

DP-1329/GA PC$4.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S. C. Savannah River Lab.
CONFINEMENT OF AIRBORNE RADIOACTIVITY. PROGRESS REPORT, JULY--DECEMBER 1972.
A. G. Evans. Jun 73, 18p
Contract AT(07-2)-1

Descriptors: (*Production reactors, *Containment systems), (*Activated carbon, *Physical radiation effects), Combustion, Desorption, Iodine, Performance testing, Savannah river plant.

For abstract, see NSA 28 07, number 17476.

DUN-7777-8/GA PC$3.00/MF$1.45
United Nuclear Industries, Inc., Richland, Wash. (Usa).
SYSTEM ACTION PLAN, SYSTEM NO. 08: CHEMICAL DECONTAMINATION.
W. K. Kratzer. 20 Dec 71, 18p
Contract AT(45-1)-1857

Descriptors: (*N-reactor, *Decontamination), Cost, Radioactive waste disposal, Reactor maintenance, Reactor operation.

For abstract, see NSA 28 08, number 20332.

GEAP-13317-2/GA PC$4.00/MF$1.45
General Electric CO., San Jose, Calif. Atomic Power Equipment Dept.
BWR BLOWDOWN HEAT TRANSFER SECOND QUARTERLY PROGRESS REPORT, OCTOBER 1--DECEMBER 31, 1972.
Dec 72, 21p
Contract AT(04-3)-189

Descriptors: (*Bwr type reactors, *Blowdown), Critical heat flux, Fuel element clusters, Heat transfer, Heaters, Performance, Simulation, Testing, Thermocouples.

For abstract, see NSA 28 07, number 17350.

GEAP-13923-2/GA PC$4.00/MF$1.45
General Electric CO., Sunnyvale, Calif. Breeder Reactor Dept.
SODIUM-COOLED REACTORS SAFETY ENGINEERING PROGRAM. SECOND QUARTERLY REPORT, NOVEMBER 1972--JANUARY 1973.
Feb 73, 32p
Contract AT(04-3)-893

Descriptors: (*Fbr type reactors, Reactor safety), (*Sodium cooled reactors, Reactor safety), (*Reactor safety, *Research programs), Comparative evaluations, Computer calculations, Excursions, Failures, Fuel rods, Reactor core disruption, Safety engineering, Transients, Treat reactor.

For abstract, see NSA 28 07, number 17503.

JAERI-M-5025/GA PC$7.60/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
REPORT ON THE OPERATION, UTILIZATION, AND TECHNICAL DEVELOPMENT OF RESEARCH REACTORS AND HOT LABORATORY.
Nov 72, 183p
In Japanese. U.S. Sales Only.

Descriptors: (*Jrr-2 reactor, *Reactor operation), (*Jrr-3 reactor, Reactor operation), (*Jrr-4 reactor, Reactor operation), (*Hot labs, *Operation), Materials testing, Nuclear fuels, Reactor experimental facilities, Reactor maintenance, Research programs.

For abstract, see NSA 28 07, number 17460.

JAPFNR-102/GA PC$6.25/MF$1.45
Power Reactor and Nuclear Fuel Development Corp., Oarai (Japan). Oarai Engineering Center.
COMPUTER CODE FOR SAFETY ANALYSIS. 1. SODIUM BOILING (SINGLE BUBBLE MODEL) NAIS-P.
K. Haga, T. Takahashi, Y. Kikuchi, and M. Hori. Aug 72, 84p PNC-N-941-72-9
U.S. Sales Only.

Descriptors: (*Sodium cooled reactors, *Reactor safety), (*Fbr type reactors, Reactor safety), (*Computer codes, *N codes), Boiling, Mathematical models, Reactor channels, Sodium, Transients.

For abstract, see NSA 28 07, number 17504.

JAPFNR-108/GA PC$3.00/MF$1.45
Power Reactor and Nuclear Fuel Development Corp., Tokai (Japan).
PROGRESS OF SODIUM COOLED FAST BREEDER REACTOR DEVELOPMENT IN JAPAN.
K. Tomabechi, and S. Horiuchi. May 73, 18p PNC-N-241-27(1)
U.S. Sales Only.

Descriptors: (*Joyo reactor, *Research programs), (*Monju reactor, Research programs), Design, Reactor components, Reviews, Testing.

For abstract, see NSA 28 08, number 20291.

JAPFNR-111/GA PC$3.00/MF$1.45
Power Reactor and Nuclear Fuel Development Corp., Tokai (Japan).
PRESENT STATUS OF THE RESEARCH AND DEVELOPMENT ON THE FBR SAFETY.
Apr 73, 9p PNC-N-241-73-27(4)
U.S. Sales Only.

Descriptors: (*Fbr type reactors, Reactor safety), (*Sodium cooled reactors, Reactor safety), (*Reactor safety, *Research programs), Reactor accidents.

For abstract, see NSA 28 07, number 17505.

JUL-937-RG/GA PC$9.00/MF$1.45
Kernforschungsanlage, Juelich (West Germany). Institut fuer Reaktorentwicklung.
STUDIES ON THERMODYNAMIC TRANSIENTS IN THE CORE OF A HIGH-TEMPERATURE REACTOR.
J. Singh. Mar 73, 139p
In German. U.S. Sales Only.

Descriptors: (*Htgr type reactors, *After-heat removal), (*Process heat reactors, After-heat removal), Direct cycle cooling systems, Heat transfer, Power, Transients, Variations.

For abstract, see NSA 28 07, number 17389.

KFK-1702/GA PC$5.45/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany).
NUCLEAR SAFETY: FIRST SEMIANNUAL REPORT, 1972.
Dec 72, 96p
In German. U.S. Sales Only.

Descriptors: (*Reactor safety, *Research programs), Equipment protection devices, German federal republic, Information systems, Loss of coolant, Meltdown, Nuclear industry, Planning, Reactor accidents, Safety.

For abstract, see NSA 28 08, number 20345.

KFK-1761/GA PC$3.75/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Reaktorbauelemente.
PRESSURE EQUALIZATION SYSTEM FOR FUEL RODS OF WATER COOLED REACTORS AND STEAM COOLED FAST BREEDERS. OUT-OF-PILE INVESTIGATIONS.
S. Malang, S. Mueller, and G. Thun. Apr 73, 32p
In German. U.S. Sales Only.

Descriptors: (*Bwr type reactors, Fuel rods), (*Steam cooled reactors, Fuel rods), (*Fbr type reactors, Fuel rods), (*Fuel rods, *Design), Con-

figuration, Coolant loops, Fuel cans, Mockup, Power reactors, Pressure gradients, Reactor cooling systems, Testing.

For abstract, see NSA 28 08, number 20234.

KFK-1791/GA PC$6.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Reaktorentwicklung.
ASSESSMENT OF COMMERCIALLY AVAILABLE FINITE-ELEMENT-CODES FOR THE DYNAMIC ANALYSIS OF STRUCTURES.
H. Zehlein. Apr 73, 76p
In German. U.S. Sales Only.

Descriptors: (*Reactors, Mechanical structures), (*Mechanical structures, *Stress analysis), Computer codes, Deformation, Finite element method, Reactor accidents, Safety, Stresses.

For abstract, see NSA 28 08, number 20361.

KFK-1794/GA PC$7.50/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Reaktorentwicklung.
INVESTIGATIONS ON THE FLOW AND TEMPERATURE DISTRIBUTION DOWNSTREAM OF LOCAL COOLANT BLOCKAGES IN ROD BUNDLE SUBASSEMBLIES.
D. Kirsch. May 73, 107p
In German. U.S. Sales Only.

Descriptors: (*Fbr type reactors, *Fuel channels), (*Sodium cooled reactors, Fuel channels), Boiling, Coolant loops, High temperature, Liquid flow, Medium temperature, Mockup, Reactor cooling systems, Reactor cores, Reactor safety, Sodium, Spacers, Spatial distribution, Water.

For abstract, see NSA 28 08, number 20346.

LA-UR-73-815/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex. Naval Research Lab., Washington, D. C.
TEMPERATURE CONTROL OF IRRADIATION EXPERIMENTS WITH GAS-CONTROLLED HEAT PIPES.
J. E. Deverall, and H. E. Watson. 12p CONF-730910-8

Descriptors: (*Irradiation capsules, *Temperature control), (*Heat pipes, Irradiation capsules), Performance, Uses.

For abstract, see NSA 28 08, number 18154.

LFEN-146-a/GA PC$3.75/MF$1.45
Junta de Energia Nuclear, Sacavem (Portugal). Laboratorio de Fisica E Engenharia Nucleares.
SYSTEM FOR ACQUISITION OF DATA FOR ANALYSIS OF NOISE.
J. M. Costa Oliveira, D. F. Trigueiros, and J. M. Pombo Duarte. 1972, 33p
In Portuguese. U.S. Sales Only.

Descriptors: (*Reactor noise, *Data acquisition), Computer calculations, Computers, Data processing, Diagrams.

For abstract, see NSA 28 07, number 17574.

NP-19817/GA PC$16.25/MF$1.45
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
PHYSICAL ASPECTS OF THE EFFECTS OF NUCLEAR REACTORS IN WORKING AND PUBLIC ENVIRONMENTS.
R. H. Clarke. Jan 73, 282p
U.S. Sales Only.

Descriptors: (*Power reactors, Radiation hazards), (*Nuclear fuels, *Isotope ratio), (*Human populations, *Radiation doses), (*Radiation hazards, *Mathematical models), Computer calculations, Computer codes, Environment, Fission products, Gaseous wastes, Internal irradiation, Leaks, Man, Meteorology, Organs, Radioactive clouds, Radioactive wastes, Radioactivity, Radioisotopes, Radionuclide kinetics.

For abstract, see NSA 28 08, number 18544.

N73-31619/2GA PC$6.00/MF$1.45
Internationale Atomreaktorbau Gesellschaft, Bensberg (West Germany).
DEVELOPMENT OF IDA, AND INTEGRATED HEAT EXCHANGER/STEAM GENERATOR FOR SODIUM-COOLED FAST BREEDER REACTORS.
Final Report.
P. Albus, K. Dumm, K. Foerster, R. Gerstler, and G. Hahn. Dec 72, 76p BMBW-FB-K-72-28
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
In German; English Summary.

Descriptors: *Breeder reactors, *Liquid metal cooled reactors, *Steam, *Tube heat exchangers, Copper, Fast nuclear reactors, Sodium, Steel structures.

For abstract, see STAR 1122

ORNL-NSIC-111/GA PC$15.00/MF$1.45
Oak Ridge National Lab., Tenn.
REACTOR PROTECTION SYSTEMS: PHILOSOPHIES AND INSTRUMENTATION REVIEWS FROM NUCLEAR SAFETY.
E. W. Haden. Jul 73, 270p
Contract W-7405-eng-26

Descriptors: (*Reactor protection systems, *Design), (*Reactor control systems, *Reviews), Electrical equipment, Electronic equipment, Equipment protection devices, Reactor accidents, Reactor instrumentation, Reactor safety, Reliability, Scram.

For abstract, see NSA 28 07, number 17519.

ORNL-TM-4182/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
POSTIRRADIATION EVALUATION OF BORON CARBIDE FROM EBR-II HIGHER WORTH CONTROL ROD.
G. L. Copeland, and R. G. Donnelly. Jun 73, 20p
Contract W-7405-eng-26

Descriptors: (*Ebr-2 reactor, *Control elements), (*Boron carbides, *Physical radiation effects), Burnup, Metallography, Performance testing, Swelling.

For abstract, see NSA 28 08, number 20411.

ORNL-4832/GA PC$12.25/MF$1.45
Oak Ridge National Lab., Tenn.
MOLTEN-SALT REACTOR PROGRAM SEMI-ANNUAL PROGRESS REPORT FOR PERIOD ENDING AUGUST 31, 1972.
Mar 73, 204p
Contract W-7405-eng-26

Descriptors: (*Molten salt reactors, *Research programs), Chemical reactions, Design, Leading abstract, Molten salt fuels, Reprocessing.

For abstract, see NSA 28 07, number 17432.

PB-224 478/8GA PC$2.85/MF$1.45
Division of Reactor Development and Technology (AEC), Washington, D.C.
AN EVALUATION OF THE MOLTEN SALT BREEDER REACTOR.
Sep 72, 65p* WASH-1222
Paper copy also available from GPO $0.85 as Y3.AT7:22/WASH/1222.

Descriptors: (*Molten salt nuclear reactors, Evaluation), Breeder reactors, Nuclear reactor fuels, Nuclear reactor coolants, Nuclear reactor safety, Design criteria, Thorium isotopes, Feasibility.

The Molten Salt Breeder Reactor, if successfully developed and marketed, could provide a useful supplement to the currently developing uranium-plutonium reactor economy. This concept offers the potential for: Breeding in a thermal spectrum reactor; efficient use of thorium as a fertile material; elimination of fuel fabrication and spent fuel shipping; and, high thermal efficiencies. Notwithstanding these attractive features, this assessment has reconfirmed the existence of major technological and engineering problems affecting feasibility of the concept as a reliable and economic breeder for the utility industry. The principal concerns include uncertainties with materials, with methods of controlling tritium, and with the design of components and systems along with their special handling, inspection and maintenance equipment. Many of these problems are compounded by the use of a fluid fuel in which fission products and delayed neutrons are distributed throughout the primary reactor and reprocessing systems.

PB-224 479/6GA PC$2.75/MF$1.45
Division of Reactor Development of Technology (AEC), Washington, D.C.
AN EVALUATION OF THE GAS COOLED FAST REACTOR.
Sep 72, 52p* WASH-1223
Paper copy also available from GPO $0.75 as Y3.AT7:22/WASH/1223.

Descriptors: (*Gas cooled reactors, Evaluation), Fast reactors(Nuclear), Nuclear reactor accidents, Electric power generation, Helium, Carbide nuclear fuels, Oxide nuclear fuels.
Identifiers: *Gas cooled fast reactors.

The Gas Cooled Fast Reactor (GCFR) concept uses helium as the coolant gas, which leads to several potentially favorable attributes of the GCFR. Helium is both optically and neutronically transparent and does not become radioactive. An intermediate heat exchanger system is not required which reduces system complexity. The GCFR has a potentially high breeding ratio resulting largely from the coolant properties. This advantage may be partially offset by the higher specific fissile inventory (Kg/MWe) required due to the poorer heat transfer properties of helium as compared to sodium. Since the use of gas cooling requires a high coolant pressure to secure adequate heat transfer, the GCFR is subject to the possibility of depressurization accidents as well as loss-of-flow accidents. The potential for occurrence of these types of accidents requires resolution of significant reactor damage and safety questions which are unique to the GCFR concept. In addition, there are other outstanding engineering problems associated with safety, reliability and maintainability which differ significantly from similar considerations for the HTGR and LMFBR.

PB-224 698/1GA PC$5.25/MF$1.45
Southwest Research Inst., San Antonio, Tex.
A JOINT INDUSTRY/UTILITY PROGRAM TO DEVELOP NDT TECHNIQUES FOR NUCLEAR REACTOR INSPECTION: ADDENDUM REPORT.
Final rept. 1 Jul-1 Nov 72,
J. S. Buck, L. J. Graham, Nicole Chretien, R. L. Bell, and H. D. Collins. 21 May 73, 182p* SwRI-17-2440-8A EEI/TVA-RP-79-8A
Sponsored in part by Tennessee Valley Authority. See also report dated 21 May 73, PB-222 701.

Descriptors: (*Power reators(Nuclear), *Nuclear reactor safety), (*Pressure vessels, Inspection), (*Electric ulilities, Power reactors(Nuclear)), Ultrasonic tests, Acoustic measurement, Nondestructive tests, Holography, Schlierem photog-

raphy, Graphic methods, Fractures(Materials), Abstracts.
Identifiers: Acoustic holography, Ultrasonic holography.

The report, compiled and published by the Dept. of Special Engineering Services, Southwest Research Institute (SwRI) summarizes the work performed at the EEI/TVA Nondestructive Test Method Evaluation Facility, located at the National Reactor Test Site, Idaho Falls, Idaho, July thru October 1972. The facility used was the Experimental Beryllium Oxide Reactor (EBOR). The major objective of the test program was to monitor flaw growth in the reactor pressure vessel with simulated plant noise and environment using prototype acoustic emission and acoustic holographic systems and conventional nondistructive inspection techniques.

RCN-183/GA PC$6.75/MF$1.45
Reactor Centrum Nederland, Petten.
FAST REACTOR PROGRAMME. FOURTH QUARTER 1972 PROGRESS REPORT.
E. K. Hoekstra. Feb 73, 93p
U.S. Sales Only.

Descriptors: (*Stek reactor, *Reactor lattice parameters), (*Fbr type reactors, *Research programs), (*Sodium cooled reactors, Research programs), (*Fuel elements, *Performance testing), Aerosol monitoring, Aerosols, Fission ratio, Fluid flow, Fuel cans, Fuel element clusters, Fuel pellets, Heat transfer, Neutron spectra, Physical radiation effects, Reactivity worths, Stainless steel-304, Stainless steel-316, Thermodynamic properties, Uranium carbides, Uranium nitrides.

For abstract, see NSA 28 08, number 20297.

RCN-187/GA PC$6.00/MF$1.45
Reactor Centrum Nederland, Petten.
FAST REACTOR PROGRAMME. FIRST QUARTER 1973 PROGRESS REPORT.
E. K. Hoekstra. May 73, 79p
U.S. Sales Only.

Descriptors: (*Fbr type reactors, *Research programs), (*Stek reactor, *Neutron flux), (*Snr reactor, *Containment systems), (*Uranium carbides, *Physical properties), Aerosols, Configuration, Failures, Flowmeters, Fuel pins, Hydraulics, Liquid flow, Loss of coolant, Neutron spectra, Performance testing, Physical radiation effects, Reactor accidents, Reactor cores, Reactor instrumentation, Reactor kinetics, Sodium, Steels, Uranium nitrides.

For abstract, see NSA 28 08, number 20298.

RFP-Trans-132/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
CEA POLICY IN THE DESIGN, MANAGEMENT, AND SAFETY OF HOT FACILITIES.
R. Mas. (nd). 14p
Translated from IAEA Paper SM--125/49.

Descriptors: (*Hot labs, *Management), Cea, Construction, Design, Planning, Radiation protection, Safety, Security.

For abstract, see NSA 28 08, number 18217.

RFP-Trans-133/GA PC$3.00/MF$1.45
European Atomic Energy Community, Karlsruhe (West Germany). European Transuranium Inst.
THREE YEARS OF EXPERIENCE IN THE HANDLING OF IRRADIATED PLUTONIUM, AMERICIUM, AND CURIUM.
G. Samsel, J. Vaane, and E. de Ras. (nd). 11p
Translation of IAEA Paper SM--125/52.

Descriptors: (*Hot labs, *Operation), (*Plutonium, *Remote handling), (*Americium, Remote handling), (*Curium, Remote handling), Irradiation, Radiation protection, Safety.

For abstract, see NSA 28 08, number 18218.

RFP-Trans-134/GA PC$3.00/MF$1.45
INTERVENTION IN A HIGH-ACTIVITY CELL BY MEANS OF A HEAVY-DUTY REMOTE-CONTROL MANIPULATOR.
A. Calame-Longjean. 1965, 13p
Translation of IAEA Paper SM--125/15.

Descriptors: (*Hot cells, *Decontamination), (*Remote handling equipment, *Maintenance), Fuel elements, Radioactivity, Reprocessing, Safety.

For abstract, see NSA 28 08, number 18926.

RFP-Trans-135/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
DISMANTLING OF HIGH ACTIVITY CELLS AND DECONTAMINATION OF THEIR EQUIPMENT IN A WORKSHOP.
J. Bourdrez, Y. Marque, B. Roger, E. Bertrand, and L. Peronnet. (nd). 6p
Translation of IAEA Paper SM--125/18.

Descriptors: (*Hot cells, *Maintenance), (*Remote handling equipment, *Decontamination), France, Radiation protection.

For abstract, see NSA 28 08, number 18927.

RISO-277/GA PC$3.50/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
ACOUSTIC EMISSION SURVEILLANCE METHODS.
A. Nielsen. Dec 72, 28p
U.S. Sales Only.

Descriptors: (*Reactors, Pressure vessels), (*Pressure vessels, *Acoustic emission testing), Defects, Inspection, Monitoring, Reactor instrumentation, Reactor safety.

For abstract, see NSA 28 07, number 17577.

UCRL-50007-72-3/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
HAZARDS CONTROL PROGRESS REPORT NO. 44, SEPTEMBER--DECEMBER 1972.
B. N. Odell. 29 Mar 73, 24p
Contract W-7405-eng-48

Descriptors: (*Hazards, *Control), (*Measuring instruments, *Research programs), Fires, Leading abstract, Radiation protection.

For abstract, see NSA 28 08, number 18219.

UNI-15/GA PC$5.50/MF$1.45
United Nuclear Industries, Inc., Richland, Wash. (Usa).
OPERATING SAFETY LIMITS: N REACTOR.
1 Jun 73, 66p

Descriptors: (*N-reactor, *Reactor safety), Reactor operation, Specifications.

For abstract, see NSA 28 07, number 17521.

WAPD-TM-999/GA PC$4.75/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA.
FLASH-5: A FORTRAN IV PROGRAM FOR TRANSIENT SIMULATION OF A REACTOR PLANT WITH A DETAILED CORE.
J. H. Murphy, J. A. Redfield, and V. C. Davis.
May 73, 51p
Contract AT(11-1)-Gen-14

Descriptors: (*Pwr type reactors, Excursions), (*Loss of coolant, *Pressure gradients), (*Computer codes, *F codes), (*Excursions, Pressure gradients), Fortran, Liquid flow, Pressure dependence, Reactor cores, Reactor safety, Transients.

For abstract, see NSA 28 08, number 20347.

WARD-5941/GA PC$3.00/MF$1.45
Westinghouse Electric Corp., Madison, PA. Advanced Reactors Div.
FFTF PROBE TYPE EDDY-CURRENT FLOWMETER WET VS. DRY PERFORMANCE EVALUATION IN SODIUM.
T. J. Costello, R. L. Laubham, W. R. Miller, and C. R. Smith. 1972, 14p CONF-721109-24
Contract AT(45-1)-2171

Descriptors: (*Flowmeters, *Performance testing), (*Fftf reactor, Flowmeters), (*Sodium, Flowmeters), Eddy currents, Electronic circuits, Flow rate, Fuel assemblies, Liquid flow, Reactor cores.

For abstract, see NSA 28 07, number 17465.

ZJE-130/GA PC$4.75/MF$1.45
Skoda Works, Pilsen (Czechoslovakia). Nuclear Power Construction Dept.
EVALUATION OF CONSEQUENCES OF AN ATOMIC POWER PLANT PRIMARY CIRCUIT RUPTURE.
J. Hulovec. 1972, 53p
U.S. Sales Only.

Descriptors: (*Gas cooled reactors, *Loss of coolant), (*Bohunice a-1 reactor, Loss of coolant), A codes, Computer calculations, Flow rate, Gas flow, Leaks, Primary coolant circuits, Reactor accidents, Ruptures.

For abstract, see NSA 28 07, number 17523.

18J. Reactor Materials

AD-768 754/4GA PC$3.00/MF$1.45
Naval Ordnance Lab White Oak Md
RADIOACTIVE MATERIAL ACCOUNTABILITY: A COMPUTER ROUTINE TO PRODUCE THE REQUIRED RECORDS,
Richard P. Marquiss. 8 Aug 73, 35p Rept no. NOLTR-73-146

Descriptors: (*Radioactive isotopes, Inventory analysis), (*Programming(Computers), Inventory analysis), Health physics, Radiation hazards, Computer programs.
Identifiers: *Radioactive materials, *Nuclear materials management.

The maintenance of accurate radioactive material accountability records is one of the perpetual problems associated with the pursuit of an effective health physics program. A small but vitally important section of the accountability requirement is the periodic leak testing of all sealed quantities of radioactive materials. Leak test records must must be maintained to show that the tests were performed, and that leakage, if any, is within the allowable limits. There are many methods that can be used to satisfy the record keeping requirements. The choice of method is somewhat dictated by the size of the inventory and the available computational equipment. Where a modern multi-language digital computer is available, the computerization of the inventory maintenance problem will provide for accurate records at low cost. One such scheme of computer record keeping is presented. (Author) Portions of this document are not fully legible.

AECL-4520/GA PC$3.00/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.

CANADIAN FUEL PERFORMANCE.
J. A. L. Robertson, R. D. Page, and L. L. Bodie.
May 73, 15p CONF-730611-13
U.S. Sales Only.

Descriptors: (*Npd reactor, *Fuel elements), (*Candu reactor, Fuel elements), (*Pickering-1 reactor, Fuel elements), (*Pickering-2 reactor, Fuel elements), Burnup, Failures, Gentilly reactor, Leaks, Performance, Pickering-3 reactor, Reactor operation, Uranium dioxide, Zircaloy.

For abstract, see NSA 28 08, number 20279.

AERE-R-6062/GA PC$4.75/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
STRUCTURE OF REACTOR GRAPHITES AND ITS EFFECT ON DIMENSIONAL STABILITY AT HIGH TEMPERATURES.
P. A. Thrower. Apr 69, 55p
U.S. Sales Only.

Descriptors: (*Graphite, *Microstructure), Binders, Boron additions, Chemical analysis, Correlations, Crystal lattices, Defects, Diffusion, Dimensions, Dislocations, Distribution, Electron microscopy, Grain size, Nucleation, Physical radiation effects, Stability, Structural models, Vacancies, Very high temperature, X-ray diffraction.

For abstract, see NSA 28 07, number 16115.

AERE-R-7065/GA PC$3.00/MF$1.45
Atomic Energy Research Establishment, Harwell (England).
ESTIMATION OF HYDROXAMIC ACIDS FORMED IN TBP/OK DURING REPROCESSING.
A. Pilbeam. May 73, 13p
U.S. Sales Only.

Descriptors: (*Hydroxamic acids, *Spectrophotometry), (*Spent fuels, *Reprocessing), Quantitative chemical analysis, Sensitivity, Solvent extraction, Solvents, Tbp, Vanadium.

For abstract, see NSA 28 07, number 15202.

AI-AEC-13082/GA PC$4.25/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
PROCESS DEVELOPMENT AND FABRICATION OF ZIRCONIUM HYDRIDE HASTELLOY X CLAD FUEL ELEMENTS.
T. G. Jr. Parker. 30 Jun 73, 44p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, Fuel elements), (*Fuel elements, *Fabrication), (*Hastelloy x, Fabrication), (*Zirconium hydrides, Fabrication), Cladding, Deposition, Fuel cans, Gadolinium oxides, Performance, Uranium alloys.

For abstract, see NSA 28 07, number 15984.

AI-AEC-13083/GA PC$5.00/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
HASTELLOY X CLADDING MATERIAL EVALUATION.
K. E. Moore, R. G. Brengle, and T. G. Jr. Parker.
15 Jun 73, 57p
Contract AT(04-3)-701

Descriptors: (*Hastelloy x, *Corrosion), (*Fuel cans, Corrosion), (*Potassium alloys, *Corrosive effects), (*Sodium alloys, Corrosive effects), Aging, Creep, Electron microscopy, Fabrication, Fuel elements, Intergranular corrosion, Interstitials, Liquid flow, Liquid metals, Mechanical properties, Neutron beams, Neutrons, Physical radiation effects, Precipitation, Ruptures, Space power reactors, Stresses, Testing, Tubes, Very high temperature.

For abstract, see NSA 28 07, number 15945.

AI-AEC-13084/GA PC$5.75/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
ZIRCONIUM HYDRIDE FUEL ELEMENT PERFORMANCE CHARACTERISTICS.
A. F. Lillie, D. T. McClelland, W. J. Roberts, and J. H. Walter. 19 Jun 73, 75p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, Fuel elements), (*Fuel elements, *Performance testing), Failures, Fuel cans, Hydrogen, Leaks, Swelling, Uranium alloys, Zirconium hydrides.

For abstract, see NSA 28 07, number 17481.

BMFT-FBK-73-8/GA PC$5.00/MF$1.45
Gesellschaft fuer Kernforschung M.B.H., Karlsruhe (West Germany). Internationale Atomreaktorbau G.M.B.H., Bensberg (West Germany).
FINAL REPORT ON THE FEASIBILITY STUDY CONCERNING THE INSERTION OF A FAST CORE INTO THE COMPACT SODIUM-COOLED NUCLEAR FACILITY.
Apr 73, 56p
In German. U.S. Sales Only.

Descriptors: (*Knk reactor, *Reactor cores), (*Snr reactor, Reactor cores), Fuel assemblies, Fuel element clusters, In core instruments, Planning, Testing.

For abstract, see NSA 28 07, number 17423.

BNL-17901/GA PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N. Y.
EXPERIENCE WITH STRESS CORROSION CRACKING AND MATERIALS COMPATIBILITY AT THE HIGH FLUX BEAM REACTOR.
R. W. Powell, J. G. Y. Chow, W. J. Brynda, M. H. Brooks, and J. R. Weeks. 1973, 16p CONF-730801-4

Descriptors: (*Hfbr reactor, *Primary coolant circuits), (*Stainless steel-304, *Stress corrosion), (*Aluminium, Stress corrosion), Cracks, Failures, Flanges, Pipes, Reactor materials, Stress analysis, Temperature dependence.

For abstract, see NSA 28 07, number 17458.

CEA-CONF-2283/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Paris (France).
INTERNATIONAL COOPERATION IN THE REALM OF REPROCESSING OF IRRADIATED FUELS.
J. Couture. 9p CONF-730341-1
In French. U.S. Sales Only.

Descriptors: (*Spent fuels, Reprocessing), (*Reprocessing, *International cooperation), Eurochemic, International agreements, Legal aspects.

For abstract, see NSA 28 08, number 18084.

CEA-CONF-2320/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
MACHINING OF MULTIHOLE GRAPHITE BLOCKS.
R. Bujas. 18 Apr 73, 6p CONF-730544-1
U.S. Sales Only.

Descriptors: (*Graphite, *Machining), (*Htgr type reactors, *Fuel elements), Control, Economics, Industry, Production, Specifications.

For abstract, see NSA 28 08, number 18598.

CEA-R-4432/GA PC$4.25/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
THEORETICAL MODEL OF THERMAL INTERACTION BETWEEN URANIUM DIOXIDE AND SODIUM.
P. Syrmalenios. Jun 73, 43p
In French. U.S. Sales Only.

Descriptors: (*Uranium dioxide, Fuel-coolant interactions), (*Sodium, Fuel-coolant interactions), (*Fuel-coolant interactions, *Mathematical models), Heat transfer, Pressure dependence, Thermal expansion, Thermodynamic properties, Vapor pressure.

For abstract, see NSA 28 07, number 17592.

CEA-R-4446/GA PC$6.25/MF$1.45
Commissariat a l'Energie Atomique, Bruyeres-le-Chatel (France). Centre d'Etudes.
PREPARATION OF BORON-ENRICHED B SUB 12 H SUB 12 --IONS FOR USE IN AQUEOUS SOLUTION AS A NEUTRON ABSORBER FOR A HEAVY WATER NUCLEAR REACTOR.
J. Penneroux. Jun 73, 82p
In French. U.S. Sales Only.

Descriptors: (*Borohydrides, *Chemical preparation), (*Boranes, Chemical preparation), (*Isotope enriched materials, Chemical preparation), (*Boron compounds, Chemical preparation), Aqueous solutions, Boron 10, Heavy water cooled reactors, Lithium compounds, Neutron absorbers.

For abstract, see NSA 28 08, number 17944.

CONF-721012-3/GA PC$4.25/MF$1.45
Westinghouse Electric Corp., Madison, PA. Advanced Reactors Div.
USING EXISTING DATA FOR COMPONENT DESIGN CONSIDERING CREEP-FATIGUE INTERACTION.
A. L. Snow. 1972, 45p
Contract AT(45-1)-2171

Descriptors: (*Fftf reactor, *Primary coolant circuits), (*Reactor components, *Stress analysis), (*Stainless steel-304, *Creep), (*Stainless steel-316, Creep), Design, Fatigue, Plasticity.

For abstract, see NSA 28 07, number 17459.

CONF-730701-1/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
CHEMISTRY AND THERMODYNAMICS OF MOLTEN SALT REACTOR FUELS.
C. F. Jr. Baes. 1973, 38p

Descriptors: (*Molten salt fuels, *Chemistry), Actinides, Breeder reactors, Chemical reactions, Fission products, Molten salt reactors, Reactor materials, Thermodynamics.

For abstract, see NSA 28 07, number 15266.

CONF-730803-2/GA PC$4.00/MF$1.45
Westinghouse Research Labs., Pittsburgh, PA. Westinghouse Electric Corp., Madison, PA. Advanced Reactors Div.
EXPERIMENTAL DETERMINATION OF TURBULENT EXCHANGE COEFFICIENTS IN A MODEL REACTOR ROD BUNDLE.
M. Roidt, B. J. Vegter, M. J. Pechersky, and R. A. Markley. 1973, 38p
Contract AT(11-1)-3045

Descriptors: (*Power reactors, Fuel element clusters), (*Fuel element clusters, *Heat transfer), C codes, Configuration, Fuel rods, Gas flow, Liquid flow, Mockup, Tracer techniques, Transport theory.

For abstract, see NSA 28 07, number 17551.

CONF-730807-2/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
TRACE IMPURITIES IN FUELS BY ISOTOPE DILUTION MASS SPECTROMETRY.
J. A. Carter, R. L. Walker, and J. R. Sites. 1973, 13p

Descriptors: (*Uranium, *Isotope dilution), (*Mercury, Isotope dilution), (*Lead, Isotope dilution), (*Cadmium, Isotope dilution), Chemical analysis, Coal, Fuels, Gasoline, Mass spectroscopy, Quantitative chemical analysis, Trace amounts.

For abstract, see NSA 28 07, number 15204.

CONF-730916-2/GA PC$3.50/MF$1.45
Foster Wheeler Corp., Livingston, N. J.
NON-LINEAR CREEP FATIGUE ANALYSIS OF A SODIUM HEAT EXCHANGER COMPONENT FOR THE FAST FLUX TEST FACILITY.
A. C. Gangadharan, D. H. Pai, and I. Berman. 1972, 29p

Descriptors: (*Fftf reactor, *Heat exchangers), (*Stainless steel-304, *Creep), Configuration, Nozzles, Thermal fatigue, Thermal stresses, Transients.

For abstract, see NSA 28 08, number 20306.

CONF-730918-1/GA PC$3.25/MF$1.45
Foster Wheeler Corp., Livingston, N. J.
DESIGN OF THE INTERMEDIATE HEAT EXCHANGER FOR THE MAIN COOLANT LOOP OF THE FFTF.
W. Wolowodiuk, and B. E. Dawson. 21p

Descriptors: (*Fftf reactor, *Heat exchangers), Design, Heat transfer, Liquid flow, Performance, Specifications.

For abstract, see NSA 28 08, number 20307.

CONF-731003-2/GA PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn.
COMPARISONS OF THEORETICAL AND EXPERIMENTAL STRESSES FOR SPHERICAL SHELLS HAVING SINGLE NONRADIAL NOZZLES.
R. C. Gwaltney, and W. L. Greenstreet. 33p

Descriptors: (*Pressure vessels, *Nozzles), Design, Mathematical models, Shells, Stress analysis, Stresses.

For abstract, see NSA 28 08, number 18168.

COO-3028-6/GA PC$3.00/MF$1.45
Princeton Univ., N. J.
PADRE SOL AND CHEMICAL FUEL PRODUCTION.
R. C. Axtmann. 13p CONF-730646-1
Contract AT(11-1)-3028

Descriptors: (*Fuels, *Production), (*Hydrogen, Production), (*Methane, Production), (*Biological wastes, *Uses), Cost, Electric power, Energy storage, Fuel cells, Solar energy.

For abstract, see NSA 28 08, number 20536.

COO-3422-1/GA PC$9.50/MF$1.45
Pennsylvania State Univ., University Park. Dept. Of Nuclear Engineering.
CORE MANAGEMENT PROGRAM TO OPTIMIZE FUEL UTILIZATION IN TRIGA RESEARCH REACTORS.
W. F. Naughton. Sep 72, 147p
Contract AT(11-1)-3422

Descriptors: (*Triga type reactors, Fuel management), (*Fuel management, *Optimization), Burnup, Cost, Fuel cycle, Fuel shuffling, Reactor fueling, Reactor operation.

For abstract, see NSA 28 07, number 17634.

DOCKET-50332-31/GA PC$3.00/MF$1.45
Allied-Gulf Nuclear Services, Barnwell, S.C.
BARNWELL NUCLEAR FUEL PLANT. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 6.
2 Jul 73, 6p

Descriptors: (*Barnwell fuel processing plant, *Licensing), (*Plutonium nitrates, *Chemical reactions), (*Plutonium oxides, *Storage).

For abstract, see NSA 28 07, number 15411.

DOCKET-50332-32/GA PC$13.75/MF$1.45
Allied-Gulf Nuclear Services, Barnwell, S.C.
BARNWELL NUCLEAR FUEL PLANT. PRELIMINARY SAFETY ANALYSIS REPORT, ADDENDUM 7.
2 Jul 73, 234p

Descriptors: (*Barnwell fuel processing plant, *Licensing), (*Plutonium nitrates, *Chemical reactions), (*Plutonium oxides, *Storage).

For abstract, see NSA 28 07, number 15412.

DOCKET-700364-1/GA PC$3.00/MF$1.45
Nuclear Materials and Equipment Corp., APOLLO, PA.
NUMEC TYPE II FACILITY. CERTIFICATE GRANTED BY PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES.
3 May 73, 5p

Descriptors: (*Fuel fabrication plants, *Environment), (*Fuel reprocessing plants, Environment), Licensing, Pollution, Water.

For abstract, see NSA 28 07, number 15493.

DP-1327/GA PC$4.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S. C. Savannah River Lab.
CUDS: COMPUTER PROGRAM FOR PROCESSING CUMULATIVE DATA STATISTICS.
L. G. Anderson, and C. W. Lewis. Jul 73, 42p
Contract AT(07-2)-1

Descriptors: (*Savannah river plant, Nuclear materials management), (*Nuclear materials management, *Accounting), (*Computer codes, C codes), (*C codes, Nuclear materials management), Calibration, Tanks, Volume.

For abstract, see NSA 28 07, number 16145.

DPSPU-70-124-4/GA PC$5.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S. C. Savannah River Plant.
SAFETY ANALYSIS REPORT UO SUB 2 SHIPPING PACKAGE (PACKAGING OF RADIOACTIVE AND FISSILE MATERIALS). FINAL REPORT.
A. A. Gates, J. W. Langhaar, and R. A. Scaggs. Jul 73, 59p
Contract AT(07-2)-1

Descriptors: (*Uranium dioxide, *Transport), (*Casks, *Safety), Highly enriched uranium, Powders.

For abstract, see NSA 28 08, number 18936.

EUR-5021/GA PC$4.25/MF$1.45
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
X-RAY CONTROL OF CORE PARTICLES FOR HIGH-TEMPERATURE REACTORS.
F. Luchtmans. Jun 73, 41p
In French. U.S. Sales Only.

Descriptors: (*Coated fuel particles, *X-ray radiography), Absorption, Electric potential, Images, Inspection, Layers, Photographic films.

For abstract, see NSA 28 07, number 15445.

EURFNR-1073/GA PC$5.75/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Material und Festkoerperforschung.
EVALUATION OF POST-IRRADIATION EXAMINATION OF UO SUB 2 /PUO SUB 2 FUEL PINS IN TEST GROUP FR-2--4A.
W. Dienst, O. Goetzmann, H. Kleykamp, G. Ondracek, and B. Schulz. Jan 73, 75p KFK-1727

Descriptors: (*Fuel pins, *Physical radiation effects), (*Uranium dioxide, Physical radiation effects), (*Plutonium oxides, Physical radiation effects), (*Stainless steels, Physical radiation effects), Compatibility, Fission products, Fuel cans, High temperature, Performance testing, Spatial distribution, Voids.

For abstract, see NSA 28 08, number 20400.

EURFNR-1075/GA PC$13.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Reaktorentwicklung.
SINEX: A CODE FOR THERMODYNAMIC AND STRENGTH DESIGN CALCULATION OF SODIUM-HEATED INTERMEDIATE HEAT EXCHANGERS.
H. Schnauder. Dec 72, 218p KFK-1686
In English and German.

Descriptors: (*Sodium cooled reactors, Heat exchangers), (*Heat exchangers, *Design), (*Computer codes, *S codes), Configuration, Optimization, Reactor operation, Specifications, Thermodynamics.

For abstract, see NSA 28 08, number 20371.

EURFNR-1085/GA PC$4.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Neutronenphysik und Reaktortechnik.
EXPERIMENTS ON THE KINETICS OF OXYGEN TRANSPORT FROM OXIDE FUEL TO THE CLAD RELATED TO GCFR FUEL PINS.
M. Bober, S. Dorner, and G. Schumacher. Sep 72, 12p KFK-1756, CONF-720995-1
U.S. Sales Only.

Descriptors: (*Gcr type reactors, Fuel pins), (*Fast reactors, Fuel pins), (*Fuel pins, *Oxidation), (*Plutonium oxides, Oxidation), Cerium oxides, Chemical composition, Fuel cans, Temperature dependence, Testing, Uranium dioxide.

For abstract, see NSA 28 08, number 20270.

EURFNR-1090/GA PC$5.75/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Reaktorentwicklung.
INVESTIGATION OF THE PLANE OF RADIAL CONSTRAINT AS A PROBLEM IN FAST SODIUM-COOLED REACTOR CORE CLAMPING STRUCTURES.
G. Class. Mar 73, 74p KFK-1769

Descriptors: (*Snr reactor, *Reactor core restraints), (*Sodium cooled reactors, Reactor core restraints), (*Fbr type reactors, Reactor core restraints), Deformation, Fuel cans, Fuel elements, Hexagonal configuration, Mechanical structures, Performance, Reactor cores, Reactor operation, Reactor safety, Spacers, Supports, Swelling.

For abstract, see NSA 28 08, number 20288.

GU-5294/GA PC$5.45/MF$1.45
Gulf United Nuclear Fuels Corp., Elmsford, N.Y.
TOPICAL REPORT, FAST REACTOR MIXED CARBIDE FUEL ELEMENT DEVELOPMENT PROGRAM. HIGH POWER AND HEAT FLUX IRRADIATION OF URANIUM--PLUTONIUM CARBIDES.
M. H. Montgomery, A. A. Strasser, J. C. Andersen, and C. Grando. Apr 73, 60p
Contract AT(11-1)-3059

Descriptors: (*Fbr type reactors, Fuel rods), (*Sodium cooled reactors, Fuel rods), (*Fuel rods, *Performance testing), (*Uranium carbides, *Physical radiation effects), Fuel cans, Melting, Plutonium carbides, Specifications, Stainless steels, Swelling.

For abstract, see NSA 28 07, number 17425.

HEDL-SA-558/GA PC$3.00/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
INSTRUMENTED IRRADIATION OF LMFBR ABSORBER MATERIAL IN THE EBR-II INCOT FACILITY.
R. A. Hildner, and A. L. Pitner. 1973, 12p CONF-730910-1
Contract AT(45-1)-2170

Descriptors: (*Boron carbides, *Physical radiation effects), (*Europium oxides, Physical radiation effects), (*Fbr type reactors, *Neutron absorbers), (*Sodium cooled reactors, Neutron absorbers), Capsules, Control elements, Gases, Helium, In core instruments, Irradiation, Temperature measurement.

For abstract, see NSA 28 08, number 20290.

HEDL-SA-573/GA PC$12.50/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
INDUSTRIAL DEVELOPMENT OF THE NUCLEAR FUEL SYSTEM FOR THE FAST TEST REACTOR. A SYSTEMS STUDY.
C. A. Burgess. May 73, 210p
Contract AT(45-1)-2170

Descriptors: (*Fftf reactor, *Fuel elements), Industry, Management, Pert method, Planning, Production, Research programs.

For abstract, see NSA 28 08, number 20310.

HEDL-SA-577/GA PC$4.25/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
IRRADIATION TEST CAPABILITIES OF THE FFTF.
D. P. Schively. 1973, 45p CONF-730910-4

Descriptors: (*Fftf reactor, *In pile loops), Design, Operation, Specifications.

For abstract, see NSA 28 08, number 20311.

JAPFNR-110/GA PC$5.00/MF$1.45
Power Reactor and Nuclear Fuel Development Corp., Tokai (Japan).
PRESENT STATUS OF RESEARCH AND DEVELOPMENT ON THE SODIUM TECHNOLOGY.
May 73, 60p PNC-N-241-73-27(3)
U.S. Sales Only.

Descriptors: (*Joyo reactor, *Reactor components), (*Monju reactor, Reactor components), (*Sodium, *Research programs), Corrosion, Materials testing, Reactor materials.

For abstract, see NSA 28 08, number 20292.

JAPFNR-112/GA PC$3.00/MF$1.45
Power Reactor and Nuclear Fuel Development Corp., Tokai (Japan).
PRESENT STATUS OF THE RESEARCH AND DEVELOPMENT OF THE FBR FUELS AND MATERIALS.
Apr 73, 4p PNC-N-241-73-27(5)
U.S. Sales Only.

Descriptors: (*Fbr type reactors, Reactor materials), (*Solid fuels, *Research programs), (*Reactor materials, Research programs), (*Sodium cooled reactors, Reactor materials).

For abstract, see NSA 28 07, number 17429.

JAPFNR-113/GA PC$3.25/MF$1.45
Power Reactor and Nuclear Fuel Development Corp., Tokai (Japan).
CREEP TESTS ON JOYO FUEL CLADDING TUBES OF SECOND TRIAL FABRICATION.
Apr 73, 24p PNC-N-241-73-27(6)
U.S. Sales Only.

Descriptors: (*Joyo reactor, *Fuel cans), (*Stainless steel-316, *Creep), Ruptures, Testing.

For abstract, see NSA 28 07, number 17430.

JAPFNR-114/GA PC$3.50/MF$1.45
Power Reactor and Nuclear Fuel Development Corp., Tokai (Japan).
FUEL AND MATERIALS IRRADIATION TEST PROGRAM AND POST IRRADIATION EXAMINATION FACILITIES IN PNC.
Apr 73, 30p PNC-N-241-73-27(7)
U.S. Sales Only.

Descriptors: (*Joyo reactor, Reactor materials), (*Monju reactor, Reactor materials), (*Reactor materials, *Physical radiation effects), (*Plutonium oxides, Physical radiation effects), Irradiation, Solid fuels, Uranium dioxide.

For abstract, see NSA 28 08, number 20293.

JUL-925-CT/GA PC$7.50/MF$1.45
Kernforschungsanlage, Juelich (West Germany).
PURIFICATION OF BURNER OFF-GASES DURING REPROCESSING OF IRRADIATED HTR FUEL ELEMENTS.
H. Beaujean, P. Filss, U. Grahmann, M. Laser, and E. Merz. Feb 73, 106p
In German. U.S. Sales Only.

Descriptors: (*Spent fuel elements, *Reprocessing), (*Radioactive waste processing, *Gaseous wastes), (*Cesium isotopes, Gaseous wastes), (*Zirconium isotopes, Gaseous wastes), Aerosols, Carbon 14, Decontamination, Gases, Krypton 85, Molecular sieves, Purification, Silica gel, Thorium carbides, Thorium oxides, Tritium, Uranium carbides, Uranium dioxide.

For abstract, see NSA 28 08, number 18085.

KFK-1392/GA PC$3.75/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Heisse Chemie.
BEHAVIOUR OF PLUTONIUM AND URANIUM IN THE WAK FLOWSHEET LABORATORY TESTS IN MIXER-SETTLERS.
W. Ochsenfeld, and W. Hoffmann. Apr 73, 35p
In German. U.S. Sales Only.

Descriptors: (*Uranium, *Solvent extraction), (*Plutonium, Solvent extraction), (*Spent fuels, *Reprocessing), Alkanes, Mixer-settlers, Nitric acid, Tbp.

For abstract, see NSA 28 08, number 18086.

KFK-1704/GA PC$6.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany).
BURNUP DETERMINATIONS IN FUEL SAMPLES IRRADIATED IN THE FR2 REACTOR.
H. Hoffmann, and H. Wertenbach. Apr 73, 79p
In German. U.S. Sales Only.

Descriptors: (*Fuel elements, *Burnup), Activation analysis, Calorimeters, Errors, Gamma spectroscopy, Mass spectroscopy, Performance, Radiation detectors, Uranium dioxide.

For abstract, see NSA 28 08, number 20402.

KFK-1803/GA PC$3.50/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Material und Festkoerperforschung.
ASSESSMENT OF THE COMPATIBILITY BEHAVIOUR OF OXIDE FUEL PINS.
O. Goetzmann, and P. Hofmann. May 73, 29p
In German. U.S. Sales Only.

Descriptors: (*Fuel pins, *Compatibility), (*Plutonium oxides, Compatibility), (*Uranium dioxide, Compatibility), Burnup, Fuel cans, Impurities, Performance, Temperature dependence.

For abstract, see NSA 28 08, number 20403.

LA-UR-73-740/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
QUALITY ASSURANCE PLAN FOR MIXED OXIDE FUEL FOR LMFBR.
R. K. Zeigler. 1973, 7p CONF-730911-1

Descriptors: (*Fbr type reactors, Fuel pellets), (*Sodium cooled reactors, Fuel pellets), (*Fftf reactor, Fuel pellets), (*Fuel pellets, *Chemical composition), Inspection, Nuclear fuels, Plutonium oxides, Quality assurance, Uranium dioxide.

For abstract, see NSA 28 08, number 20314.

LA-5255-MS/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
INITIAL DEVELOPMENT AND CHARACTERIZATION OF PLUTONIA--IRIDIUM CERMETS (PIC).
M. Tokar, M. W. Shupe, R. A. Kent, R. W. Zocher, and T. K. Keenan. May 73, 23p
Contract W-7405-eng-36

Descriptors: (*Cermets, *Fabrication), (*Fuel pellets, Fabrication), (*Plutonium 238, Fuel pellets), (*Iridium, Fuel pellets), Calcination, Ceramics, Chemical analysis, Coatings, Controlled atmospheres, Distribution, Fractography, Grinding, Heat treatments, Hot pressing, Low pressure, Metallography, Microstructure, Mixing, Particles, Plutonium oxides, Powders, Radioisotope heat sources, Size, Tensile properties.

For abstract, see NSA 28 07, number 15985.

LA-5287-PR/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
RESEARCH ON CARBON AND GRAPHITE. QUARTERLY PROGRESS REPORT, JANUARY 1--MARCH 31, 1973.
R. J. Imprescia, R. D. Reiswig, J. M. Williams, and R. E. Honnell. May 73, 20p
Contract W-7405-eng-36

Descriptors: (*Binders, Composite materials), (*Graphite, Composite materials), (*Composite materials, *Research programs), (*Carbon, Composite materials), Anisotropy, Coal tar, Flowsheets, Impregnation, Mechanical properties, Microstructure, Physical properties, Polycrystals, Reinforced materials, Temperature dependence, Thermodynamic properties, Viscosity, Chemical reaction yield, Molecular structure, Ph value, Phenols, Phenylene radicals, Polymers, Pyrolysis, Reaction kinetics, Resins, Aluminium, Carbides, Filaments, Protective coatings, Surface finishing, Synthesis, Vapor deposited coatings, Wettability.

For abstract, see NSA 28 07, number 16117.

LA-5303-MS/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
APPARATUS FOR THE REDUCTION OF TRITIUM EMISSIONS INTO THE ATMOSPHERE.
C. M. Dube, D. O. Coffin, and R. D. Stoll. Jun 73, 4p
Contract W-7405-eng-36

Descriptors: (*Radioactive waste processing, *Gaseous wastes), (*Tritium, *Separation processes), Earth atmosphere, Molecular sieves, Tritium compounds, Water.

For abstract, see NSA 28 08, number 18064.

MRR-P-2/GA PC$5.50/MF$1.45
Technische Universitaet Muenchen, Garching (West Germany). Laboratorium fuer Reaktorregelung und Anlagensicherung.
TUMHEX: A COMPUTER CODE FOR THE CALCULATION OF THE FREQUENCY RESPONSE BEHAVIOR OF SHELL-AND-TUBE TYPE COUNTERFLOW HEAT EXCHANGERS WITH RESPECT TO PRIMARY AND SECONDARY INLET TEMPERATURE AND MASS FLOW PERTURBATIONS.
A. Hoeld. Mar 73, 67p
U.S. Sales Only.

Descriptors: (*Heat exchangers, *Performance), (*Computer codes, T codes), (*T codes, Heat exchangers), Fortran, Mass transfer, Temperature dependence.

For abstract, see NSA 28 07, number 15435.

N-73-14709/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
MULTIDIMENSIONAL ANALYSIS OF FAST-SPECTRUM MATERIAL REPLACEMENT MEASUREMENTS FOR SYSTEMATIC ESTIMATION OF CROSS SECTION UNCERTAINTIES.
P. G. Klann, E. Lantz, and W. T. Mayo. Jan 73, 36p NASA-TM-X-2679, E-7069

Descriptors: (*Reactor materials, *Reactivity worths), Cross sections, Data, Fast neutrons, Neutron spectra, Neutron transport theory.

For abstract, see NSA 28 07, number 17559.

N-73-18677/GA PC$5.45/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
RESULTS OF URANIUM DIOXIDE/TUNGSTEN IRRADIATION TEST AND POST-TEST EXAMINATION.
J. F. Collins, C. E. DeBogdan, and D. C. Dilanni. Mar 73, 77p NASA-TM-X-2709

Descriptors: (*Uranium dioxide, *Physical radiation effects), (*Fuel cans, Physical radiation effects), (*Tungsten, Physical radiation effects), Failures, Fast neutrons.

For abstract, see NSA 28 08, number 18605.

NAA-SR-11728/GA PC$3.25/MF$1.45
Atomics International, Canoga Park, Calif.
STRENGTH PROPERTIES OF SNAP FUEL MATERIALS UNDER HYDROGEN LOSS CONDITIONS.
J. T. Berling, and G. E. Culley. 25 Aug 66, 24p
Contract AT(11-1)-GEN-8

Descriptors: (*Uranium alloys, *Tensile properties), (*Zirconium base alloys, Tensile properties), (*S8er reactor, *Nuclear fuels), Allotropy, Creep, High temperature, Hydrides, Hydrogen, Losses, Performance, Ruptures, Segregation, Very high temperature.

For abstract, see NSA 28 07, number 15845.

NAA-SR-9007/GA PC$3.75/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP FUEL AND CORE MATERIALS COMPATIBILITY SCREENING TESTS.
L. B. Lundberg. 1 Mar 64, 35p
Contract AT(11-1)-GEN-8

Descriptors: (*Fuel cans, *Compatibility), (*Reactor cores, Compatibility), (*Reactor materials, Compatibility), (*Snap reactors, Reactor materials), Environments, Fuel elements, Hydrogen, Very high temperature, Bonding, Carbon additions, Deposition, Diffusion coating, Enamels, Hastelloys, Zirconium hydrides, Bismuth alloys, Lead alloys, Uranium hydrides, Antimony base alloys, Thallium alloys, Tin alloys, Beryllium oxides, Nickel, Beryllium.

For abstract, see NSA 28 07, number 15947.

N73-30658/1GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CARBIDE FUEL PIN AND CAPSULE DESIGN FOR IRRADIATIONS AT THERMIONIC TEMPERATURES.
B. L. Siegel, J. G. Slaby, W. F. Mattson, and D. C. Dilanni. Sep 73, 16p NASA-TM-X-2887, E-7493

Descriptors: *Nuclear fuel elements, *Nuclear reactors, *Test equipment, *Thermionic power generation, Equipment specifications, Product development, Reactor materials, Reactor technology.

For abstract, see STAR 1121

N73-30659/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
UNRESTRAINED SWELLING OF URANIUM-NITRIDE FUEL IRRADIATED AT TEMPERATURES RANGING FROM 1100 TO 1400 K (1980 TO 2520 R).
R. G. Rohal, and T. N. Tambling. Sep 73, 15p NASA-TM-X-2907, E-7464

Descriptors: *Irradiation, *Nuclear fuels, *Swelling, Fuel capsules, Nitrides, Nuclear reactors, Stainless steels, Uranium compounds.

For abstract, see STAR 1121

N73-31614/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IRRADIATION OF THREE T-111 CLAD URANIUM NITRIDE FUEL PINS FOR 8070 HOURS AT 990 C (1815 F).
J. G. Slaby, B. L. Siegel, L. Gedeon, and R. J. Galbo. Oct 73, 39p NASA-TM-X-2878, E-7474

Descriptors: *Irradiation, *Nuclear fuel elements, *Tantalum alloys, *Uranium compounds, Heat transfer, Reactor technology, Thermocouples.

For abstract, see STAR 1122

ORNL-TM-4174/GA PC$7.50/MF$1.45
Oak Ridge National Lab., Tenn.
POSTIRRADIATION EXAMINATION OF MATERIALS FROM THE MSRE.
H. E. McCoy, and B. McNabb. Dec 72, 110p
Contract W-7405-eng-26

Descriptors: (*Graphite, *Compatibility), (*Inor-8, Compatibility), (*Lithium fluorides, *Corrosive effects), (*Beryllium fluorides, Corrosive effects), Alpha particles, Beryllium 10, Corrosion, Fission products, Helium, Lithium 7, Molten salts, Msre reactor, Neutron beams, Nuclear fuels, Nuclear reactions, Physical radiation effects, Reactor materials, Reactor materials, Tellurium, Thermal neutrons, Uranium tetrafluoride, Zirconium fluorides.

For abstract, see NSA 28 07, number 15948.

ORNL-TM-4240/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
AQUEOUS FUEL REPROCESSING QUARTERLY REPORT FOR PERIOD ENDING MARCH 31, 1973.
W. E. Unger, R. E. Blanco, D. J. Crouse, A. R. Irvine, and C. D. Watson. Jun 73, 39p
Contract W-7405-eng-26

Descriptors: (*Tritium, *Separation processes), (*Spent fuels, *Dissolution), Breeder reactors, Liquid metal cooled reactors, Reprocessing, Research programs, Heating, Oxygen, Voloxidation process, Air, Aromatics, Decomposition, Gaseous wastes, Iodinated aliphatic hydrocarbons, Iodinated aromatic hydrocarbons, Iodine, Mercury nitrates, Methyl iodide, Nitric acid, Organic iodine compounds, Radioactive waste processing, Temperature dependence, Head end processes, Distillation, Iodine 131, Nitrogen oxides, Ozone, Volatilization, Cerium, Plutonium oxides, Uranium dioxide.

For abstract, see NSA 28 07, number 15414.

ORO-4212-15/GA PC$4.00/MF$1.45
Florida Univ., Gainesville. Engineering and Industrial Experiment Station.
QUANTITATIVE DETERMINATION OF THE STRUCTURE--PROPERTY RELATIONSHIPS IN NUCLEAR FUEL ELEMENT MATERIALS. QUARTERLY PROGRESS REPORT, JANUARY 1--MARCH 31, 1973.
F. N. Rhines, R. T. DeHoff, and E. D. Whitney. Jun 73, 36p
Contract AT(40-1)-4212

Descriptors: (*Nickel, Powders), (*Powders, *Sample preparation), (*Uranium dioxide, *Mechanical properties), (*Nuclear fuels, Mechanical properties), Cold pressing, Control, Controlled atmospheres, Creep, Creep, Density, Design, Gases, Hot pressing, Hydrogen, Impurities, Laboratory equipment, Low pressure, Microscopy, Microstructure, Particle size, Physical properties, Porosity, Sintering, Surface properties, Thermal conductivity, Thermodynamic properties.

For abstract, see NSA 28 07, number 16006.

PWAC-369/GA PC$3.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn.
CONTROLLED ATMOSPHERE SINTERING OF URANIUM MONONITRIDE.
R. A. Craig, A. D. Miller, and J. G. Darrah. May 62, 31p
Contract AT(30-1)-2789

Descriptors: (*Uranium nitrides, *Sintering), (*Fuel pellets, Sintering), Carbon, Controlled atmospheres, Density, Impurities, Low pressure, Oxygen, Powders, Sintered materials, Very high temperature.

For abstract, see NSA 28 07, number 15847.

SLA-73-5154/GA PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
MECHANICAL PROPERTIES OF A POTENTIAL PULSED REACTOR FUEL, U--6 WT % MO.
J. A. Horak, E. Yao, G. L. Rorke, D. J. Sasmor, and F. Gonzalez. 36p CONF-730212-5

Descriptors: (*Nuclear fuels, *Mechanical properties), (*Pulsed reactors, Nuclear fuels), (*Uranium base alloys, Mechanical properties), (*Molybdenum alloys, Mechanical properties), Elongation, High temperature, Low temperature, Medium temperature, Temperature dependence.

For abstract, see NSA 28 08, number 18756.

SLA-73-5559/GA PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N. Mex.

OPERATING EXPERIENCE WITH URANIUM--MOLYBDENUM FUEL IN PULSED REACTORS.
J. A. Horak, J. A. Reuscher, and D. J. Sasmor.
1973, 25p CONF-730801-5

Descriptors: (*Uranium base alloys, *Mechanical properties), (*Molybdenum alloys, Mechanical properties), (*Pulsed reactors, *Fuel elements), Failures, Performance, Reactor operation.

For abstract, see NSA 28 08, number 20316.

TRG-Report-1975/GA PC$3.00/MF$1.45
United Kingdom Atomic Energy Authority, Risley (England). Reactor Group.
QUANTITATIVE ASSESSMENT OF IRRADIATION CREEP IN UO SUB 2 .
R. G. Anderson, and R. Hargreaves. May 73, 13p
U.S. Sales Only.

Descriptors: (*Uranium dioxide, *Creep), Deformation, Fuel pellets, Fuel pins, Physical radiation effects, Swelling.

For abstract, see NSA 28 07, number 15849.

UNI-SA-1/GA PC$3.00/MF$1.45
United Nuclear Industries, Inc., Richland, Wash. (Usa).
N REACTOR FUEL ELEMENT IMPROVEMENT PROGRAM, A SYSTEMS APPROACH.
E. E. Leitz. 30 May 73, 9p CONF-730811-3

Descriptors: (*N-reactor, *Fuel elements), Fabrication, Failures, Materials handling, Performance, Reactor operation.

For abstract, see NSA 28 08, number 20334.

UNI-13-A/GA PC$3.00/MF$1.45
United Nuclear Industries, Inc., Richland, Wash. (Usa).
TEST CHANGE NO. 1: PT-N-336, N REACTOR ROD CALIBRATION.
D. L. Larkin. 10 Jul 73, 5p
Contract AT(45-1)-1857

Descriptors: (*N-reactor, *Control elements), Calibration, In core instruments, Neutron flux, Neutron monitors, Testing.

For abstract, see NSA 28 08, number 20333.

WCAP-3385-35/GA PC$4.00/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. Nuclear Fuel Div.
SAXTON PLUTONIUM PROJECT QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING MARCH 31, 1973.
R. C. Goodspeed. May 73, 21p
Contract AT(11-1)-3044

Descriptors: (*Saxton reactor, *Fuel elements), (*Plutonium, *Fuel cycle), (*Pwr type reactors, Fuel cycle), (*Plutonium oxides, *Physical radiation effects), Fuel cans, Hydrogen, Inspection, Metallography, Uranium dioxide, Zircaloy-4.

For abstract, see NSA 28 07, number 17376.

18K. Reactor Physics

AAEC/TM-613/GA PC$3.75/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
APPLICATION OF THE PULSED NEUTRON TECHNIQUE TO FAST METAL SYSTEMS.
S. P. Moo, M. T. Rainbow, and A. I. M. Ritchie. Jan 73, 31p
U.S. Sales Only.

Descriptors: (*Fast reactors, *Neutron spectra), (*Subcritical assemblies, Neutron spectra), Beryllium, Counting rates, Energy spectra, Fast neutrons, Fission chambers, Neutron beams, Neutron sources, Neutron transport theory, Nuclear reaction kinetics, Preamplifiers, Pulsed neutron techniques, Resolution, Shielding, Slowing-down, Specifications, Targets, Thorium, Threshold detectors, Time dependence, Time-of-flight method.

For abstract, see NSA 28 08, number 20305.

AECL-4506/GA PC$6.00/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
REACTOR PHYSICS MEASUREMENTS USING PLUTONIUM ENRICHED-UO SUB 2 FUEL IN ZED-2. PART 1. RESULTS OF EXPERIMENTS.
R. E. Kay. Apr 73, 79p
U.S. Sales Only.

Descriptors: (*Zed-2 reactor, *Reactor lattice parameters), (*Phwr type reactors, Reactor lattice parameters), Fuel rods, Neutron flux, Plutonium oxides, Reactivity, Uranium dioxide.

For abstract, see NSA 28 07, number 17455.

AEEW-M-1201/GA PC$3.00/MF$1.45
Atomic Energy Establishment, Winfrith (England).
CY-LEAP: A SYSTEM OF COMPUTER CODES FOR CALCULATING THE SCATTERING LAW FOR AN ANISOTROPIC MATERIAL.
A. T. D. Butland. Jun 73, 15p
U.S. Sales Only.

Descriptors: (*Thermal neutrons, *Scattering), (*Graphite, *Neutron transport), (*Computer codes, *C codes), A codes, Anisotropy, Crystals, L codes.

For abstract, see NSA 28 07, number 16833.

AEEW-R-808/GA PC$4.75/MF$1.45
Atomic Energy Establishment, Winfrith (England).
REACTOR PHYSICS MEASUREMENTS ON THE WINFRITH STEAM GENERATING HEAVY WATER REACTOR.
W. N. Fox. Aug 72, 51p
U.S. Sales Only.

Descriptors: (*Sghwr reactor, *Reactor kinetics), Comparative evaluations, Computer calculations, Performance, Reactivity coefficients, Reactor lattice parameters.

For abstract, see NSA 28 08, number 20280.

AEEW-R-868/GA PC$3.25/MF$1.45
Atomic Energy Establishment, Winfrith (England).
OPTIMIZATION OF XENON CONTROL MARGINS DURING POWER MANEUVERS.
D. H. Owens. Apr 73, 23p
U.S. Sales Only.

Descriptors: (*Reactor kinetics, *Poisoning), (*Xenon, Poisoning), (*Reactor operation, *Optimization), Burnable poisons, Form factors, Power density.

For abstract, see NSA 28 08, number 20409.

ANL-7722/GA PC$13.60/MF$1.45
Argonne National Lab., Ill.
ARC SYSTEM CROSS-SECTION GENERATION CAPABILITIES, ARC-MC EXP 2 .
C. G. Stenberg, and A. Lindeman. Jun 73, 594p
Contract W-31-109-eng-38

Descriptors: (*Neutrons, *Cross sections), (*Computer codes, *B codes), D codes, Data, Data processing, I codes, Ibm computers, R codes, Reactor kinetics, S codes, X codes.

For abstract, see NSA 28 08, number 20356.

BMFT-FBK-73-7/GA PC$3.50/MF$1.45
Siemens a.G., Munich (West Germany).
DEVELOPMENT AND INVESTIGATION OF ARRANGEMENTS FOR DETERMINING POWER PEAKS IN THE CORE BY MEANS OF STATIONARY FLUX DETECTORS.
E. Klar, H. Seidelberger, and H. Bauer. Apr 73, 28p
In German. U.S. Sales Only.

Descriptors: (*Pwr type reactors, *In core instruments), Activation detectors, Calibration, Neutron detectors, Neutron flux, Power density, Spatial distribution.

For abstract, see NSA 28 07, number 17375.

EUR-5019/GA PC$4.75/MF$1.45
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
SQFRAN: COMPUTER PROGRAMME FOR A BWR CORE.
J. Garcin, V. Mastrangelo, M. Paruccini, and C. Rinaldini. Jun 73, 51p
In French. U.S. Sales Only.

Descriptors: (*Bwr type reactors, *Reactor kinetics), (*Computer codes, *S codes), Accuracy, Distribution, Economics, Iterative methods, Neutron flux, Power, Reactor cores.

For abstract, see NSA 28 08, number 20232.

GA-7542(Vol.2)/GA PC$15.50/MF$1.45
Gulf General Atomic CO., San Diego, Calif.
GAF/GAR/GAND FAST REACTOR CROSS SECTION PREPARATION SYSTEM. VOLUME II. GAND2 AND GFE2: COMPUTER PROGRAMS FOR PREPARING INPUT DATA FOR THE GAFGAR, GGC, AND MICROX CODES FROM AN ENDF/B FORMAT NUCLEAR DATA FILE.
R. J. Archibald, and D. R. Mathews. Mar 73, 267p
Contract AT(04-3)-840

Descriptors: (*Fast reactors, *Reactor kinetics), (*Neutrons, *Cross sections), (*Computer codes, *G codes), Data.

For abstract, see NSA 28 08, number 20358.

GEAP-13931/GA PC$5.45/MF$1.45
General Electric CO., Sunnyvale, Calif. Breeder Reactor Dept.
DESCRIPTION AND EVALUATION OF THE FLUX LINKING APPROACH FOR COMPUTING THREE-DIMENSIONAL FLUXES: THE COMPUTER CODE TRIAL.
C. L. Cowan, P. Greebler, B. A. Hutchins, M. D. Kelley, and R. Protsik. Mar 73, 64p
Contract AT(04-3)-893

Descriptors: (*Fbr type reactors, *Neutron flux), (*Sodium cooled reactors, Neutron flux), (*Computer codes, *T codes), Power density, Reactor kinetics, Three-dimensional calculations.

For abstract, see NSA 28 07, number 17424.

GKSS-73/E/6/GA PC$3.75/MF$1.45
Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schiffahrt M.B.H., Hamburg (West Germany).
GENDY: A GENERAL REACTOR DYNAMICS PROGRAM.
R. Fiebig, and A. Krueger. 1973, 33p
U.S. Sales Only.

Descriptors: (*Reactor kinetics equations, *Computer calculations), (*Computer codes, *G codes), Differential equations, Iterative methods.

For abstract, see NSA 28 07, number 17552.

HEDL-SA-555/GA PC$3.00/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
NEUTRONIC EFFECTS OF IRRADIATION EXPERIMENT LOADING ON FTR ENVIRONMENT.
R. B. Rothrock. 11p CONF-730910-7

Descriptors: (*Fftf reactor, *Shim rods), Control elements, Distribution, Neutron flux, Performance, Reactivity, Reactivity worths, Reactor control systems.

For abstract, see NSA 28 08, number 20410.

HEDL-SA-556/GA PC$3.25/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
FAST REACTOR FLUX-SPECTRAL CHARACTERIZATION.
W. N. McElroy. 1973, 23p CONF-730910-3
Contract AT(45-1)-2170

Descriptors: (*Fbr type reactors, *Neutron flux), (*Sodium cooled reactors, Neutron flux), (*Ebr-2 reactor, *Neutron dosimetry), (*Threshold detectors, *Performance), Errors, Neutron spectra.

For abstract, see NSA 28 08, number 20289.

HEDL-TME-73-43/GA PC$5.45/MF$1.45
Hanford Engineering Development Lab., Richland, Wash.
SUBCRITICAL REACTIVITY SURVEILLANCE PROCEDURES FOR THE FAST FLUX TEST FACILITY.
R. M. Fleischman, J. W. Jr. Upton, and R. A. Bennett. May 73, 69p
Contract AT(45-1)-2170

Descriptors: (*Fftf reactor, *Reactivity), Calibration, Configuration, Criticality, Measuring methods, Monitoring, Reactor cores, Reactor instrumentation.

For abstract, see NSA 28 08, number 20312.

JAERI-M-5020/GA PC$5.45/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
STUDIES ON THE METHODS OF COLLAPSING THE DIFFUSION COEFFICIENTS.
K. Tasaka, and Y. Seki. Oct 72, 56p
In Japanese. U.S. Sales Only.

Descriptors: (*Fast reactors, *Group constants), Mathematics, Multigroup theory, Neutron diffusion equation, One-dimensional calculations, One-group theory, Reactor kinetics, Spherical configuration.

For abstract, see NSA 28 07, number 17555.

JAERI-M-5022/GA PC$4.00/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
APPLICABILITY OF ONE-GROUP DIFFUSION THEORY FOR BURNUP ANALYSIS OF A FAST REACTOR.
H. Yoshida, and K. Tasaka. Oct 72, 12p
U.S. Sales Only.

Descriptors: (*Fast reactors, *Burnup), Multiplication factors, Neutron diffusion equation, One-group theory, Spherical configuration.

For abstract, see NSA 28 07, number 17556.

JAERI-M-5076/GA PC$4.00/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
STUDY OF THE PERTURBATION METHODS USED IN FAST REACTOR ANALYSIS.
Y. Seki. Dec 72, 37p
In Japanese. U.S. Sales Only.

Descriptors: (*Fast reactors, Reactor kinetics), (*Reactor kinetics, *Perturbation theory), Accuracy, Neutron flux, Reactivity insertions, Reactivity worths.

For abstract, see NSA 28 07, number 17557.

JAPFNR-105/GA PC$4.00/MF$1.45
Mitsubishi Atomic Power Industries, Inc., Omiya (Japan).
ANALYSIS OF JOYO MOCK-UP EXPERIMENTAL DATA BY TWO-DIMENSIONAL GAMMA-RAY HEATING DISTRIBUTION CALCUATION CODE 2D-GAMM.
T. Iwaki, Y. Seki, and H. Osada. Aug 72, 36p
PNC-J-72-18
U.S. Sales Only.

Descriptors: (*Joyo reactor, *Radiation dose distributions), Computer calculations, Gamma radiation, Gamma transport theory, Heating, Mockup, Reactor cores, Two-dimensional calculations.

For abstract, see NSA 28 07, number 17427.

JAPFNR-109/GA PC$3.00/MF$1.45
Power Reactor and Nuclear Fuel Development Corp., Tokai (Japan).
PROGRESS OF THE FAST REACTOR PHYSICS PROGRAM.
May 73, 12p PNC-N-241-73-27(2)
U.S. Sales Only.

Descriptors: (*Reactor kinetics, *Research programs), (*Joyo reactor, Reactor kinetics), (*Monju reactor, Reactor kinetics), Criticality, Mockup, Multiplication factors.

For abstract, see NSA 28 08, number 20359.

KFK-EXT-25/72-1/GA PC$5.25/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany).
FINAL REPORT ON WORK COMPLETED BY GFK DURING PHASE IIA OF THE FAST BREEDER PROJECT.
P. Engelmann, R. Hueper, G. Karsten, G. Kessler, and R. Schroeder. Feb 73, 61p
In German. U.S. Sales Only.

Descriptors: (*Snr reactor, *Research programs), Boiling, Criticality, Failed element detection, Fuel cycle, Fuel rods, Reactor components, Reactor kinetics, Reactor safety, Sefor reactor, Sneak reactor, Sodium.

For abstract, see NSA 28 07, number 17431.

KFK-1778/GA PC$8.75/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Neutronenphysik und Reaktortechnik.
INVESTIGATION OF CALCULATION OF THE DOPPLER COEFFICIENT OF FAST REACTORS.
I. Siep. Apr 73, 132p
In German. U.S. Sales Only.

Descriptors: (*Fast reactors, *Doppler coefficient), (*Sodium cooled reactors, Doppler coefficient), Cross sections, D codes, Neutrons, Reactor kinetics, Temperature dependence.

For abstract, see NSA 28 08, number 20360.

LA-4848-MS/GA PC$5.45/MF$1.45
Los Alamos Scientific Lab., N. Mex.
TWOTRAN-II: AN INTERFACED, EXPORTABLE VERSION OF THE TWOTRAN CODE FOR TWO-DIMENSIONAL TRANSPORT.
K. D. Lathrop, and F. W. Brinkley. Jul 73, 71p
Contract W-7405-eng-36

Descriptors: (*Computer codes, *T codes), (*Neutron transport theory, Computer codes), Anisotropy, Discrete ordinates, Scattering, Two-dimensional calculations.

For abstract, see NSA 28 08, number 20137.

N73-31617/6GA PC$3.25/MF$1.45
AEG-Telefunken, Frankfurt (West Germany). Fachgebiet Leistungsreaktoren.
FISSION CHAMBER DETECTOR DRIVE SYSTEM ANTRIEBSSYSTEM FUER SPALTKAMMERN.
M. Stimler. Dec 72, 24p BMBW-FB-K-72-25
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
In German; English Summary.

Descriptors: *Boiling water reactors, *Mechanical drives, *Neutron flux density, *Reactor cores, Fission, Prototypes, Radiation detectors.

For abstract, see STAR 1122

ORNL-4853/GA PC$5.45/MF$1.45
Oak Ridge National Lab., Tenn.
DOMINO, A GENERAL PURPOSE CODE FOR COUPLING DISCRETE ORDINATES AND MONTE CARLO RADIATION TRANSPORT CALCULATIONS.
M. B. Emmett, C. E. Burgart, and T. J. Hoffman. Jul 73, 123p
Contract W-7405-eng-26

Descriptors: (*Neutron transport theory, Computer codes), (*Computer codes, *D codes), Discrete ordinates, Monte carlo method, Neutron flux, Two-dimensional calculations.

For abstract, see NSA 28 08, number 20140.

RISO-M-1607/GA PC$3.25/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
GAMMA -MATRIX CONCEPT, A METHOD FOR TREATING HETEROGENEITIES IN DIFFUSION CALCULATIONS.
T. Petersen, and P. Kirkegaard. 1972, 22p
U.S. Sales Only.

Descriptors: (*Power reactors, *Neutron flux), (*Bwr type reactors, Neutron flux), (*Neutron diffusion equation, *Heterogeneous effects), Control elements, Distribution, M codes, Matrices, Monte carlo method, Neutron transport theory, Stochastic processes.

For abstract, see NSA 28 08, number 20362.

RISO-M-1616/GA PC$3.00/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
THREE-DIMENSIONAL BOILING-WATER REACTOR NEUTRON FLUX CALCULATIONS ON THE BASIS OF HOMOGENIZED FUEL BOX CROSS SECTIONS.
H. Larsen. May 73, 19p
U.S. Sales Only.

Descriptors: (*Dresden-1 reactor, *Neutron flux), C codes, Cross sections, Fuel assemblies, S codes, Three-dimensional calculations.

For abstract, see NSA 28 08, number 20236.

RT/FI-(72)47/GA PC$17.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
ELEMENTS OF FAST REACTOR PHYSICS AND CALCULATION.
A. Gandini. 31 Oct 72, 312p
In Italian. U.S. Sales Only.

Descriptors: (*Fast reactors, *Reactor kinetics equations), Boltzmann equation, Doppler effect, Heterogeneous effects, Lectures, Manuals, Perturbation theory, Reactivity.

For abstract, see NSA 28 07, number 17560.

RT/FI-(73)5/GA PC$4.25/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
NUCLEAR DATA AND INTEGRAL MEASUREMENTS CORRELATION FOR FAST REACTORS. PART 1. STATISTICAL FORMULATION.
A. Gandini. 12 Feb 73, 44p
U.S. Sales Only.

Descriptors: (*Fast reactors, *Reactor lattice parameters), Correlations, Cross sections, Data, Neutron reactions, Statistics.

For abstract, see NSA 28 08, number 20363.

SC-RR-720879/GA PC$5.75/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
PARAMETRIC INVESTIGATION OF ALL-METAL U--10 W/O MO ANNULAR ASSEMBLIES.
R. L. Coats. Jul 73, 71p

Descriptors: (*Spr-3 reactor, *Reactor lattice parameters), Configuration, Criticality, Fast reactors, Monte carlo method, Neutron spectra, Prompt neutrons, Pulsed reactors, Reactivity, Reactor kinetics.

For abstract, see NSA 28 08, number 20315.

18M. Reactors (Non-Power)

ORNL-TM-4270/GA PC$3.50/MF$1.45
Oak Ridge National Lab., Tenn.
BULK SHIELDING FACILITY QUARTERLY REPORT, JANUARY--MARCH 1973.
W. H. Tabor, S. S. III Hurt, and E. D. Lance. Jun 73, 29p
Contract W-7405-eng-26

Descriptors: (*Bsr-2 reactor, *Reactor maintenance), (*Ornl-pca reactor, Reactor maintenance), Inspection, Reactor operation.

For abstract, see NSA 28 07, number 17462.

SURRC-48/73/GA PC$3.75/MF$1.45
Scottish Research Reactor Centre, East Kilbride (Scotland).
ANNUAL REPORT, 1971--72.
H. W. Wilson. 1972, 32p
U.S. Sales Only.

Descriptors: (*Srrc-utr-100 reactor, *Reactor operation), Activation analysis, Nuclear engineering, Nuclear medicine, Radiochemistry, Research programs.

For abstract, see NSA 28 07, number 17463.

18N. Snap Technology

AI-AEC-13066/GA PC$12.00/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
SNAP PROGRAMS BIBLIOGRAPHY.
R. R. Eggleston. 30 Jun 73, 196p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, *Bibliographies), Research programs.

For abstract, see NSA 28 07, number 17478.

AI-AEC-13071/GA PC$6.25/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
SUMMARY OF SNAP 8 DEVELOPMENTAL REACTOR (S8DR) OPERATIONS.
L. D. Felten, and H. D. May. 22 Jun 73, 83p
Contract AT(04-3)-701

Descriptors: (*S8dr reactor, *Reactor operation), Performance testing, Reactor start-up, Research programs.

For abstract, see NSA 28 07, number 17479.

AI-AEC-13074/GA PC$3.75/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
OPERATIONAL HAZARDS EVALUATION FOR 5-KWE REACTOR THERMOELECTRIC SYSTEM GROUND TEST.
R. J. Tuttle. 11 Jun 73, 34p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, *Performance testing), Computer codes, Failures, Hazards, Hydride moderated reactors, Mockup, Reactor accidents, Reactor control systems, Reactor operation, Reactor safety, Reactor shutdown, Scram, Thermoelectric generators.

For abstract, see NSA 28 07, number 17499.

AI-AEC-13075/GA PC$9.75/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
REACTOR ASSEMBLY 5-KWE REACTOR THERMOELECTRIC SYSTEM.
H. Rood. 30 Jun 73, 154p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, *Design), Hydride moderated reactors, Performance, Reactor components, Reviews.

For abstract, see NSA 28 08, number 20336.

AI-AEC-13077/GA PC$11.00/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
FUEL ELEMENT AND CORE BUNDLE 5-KWE REACTOR THERMOELECTRIC SYSTEM.
L. D. Felten, and E. Moody. 22 Jun 73, 179p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, Fuel element clusters), (*Fuel element clusters, *Design), Fuel rods, Heat transfer, Hydraulics, Hydride moderated reactors, Mechanical vibrations, Performance, Reactor cores, Space power reactors, Stress analysis.

For abstract, see NSA 28 07, number 17480.

AI-AEC-13089/GA PC$3.25/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
SPACE NUCLEAR SYSTEM "SHEATHED" ELECTRICAL CABLES. SUMMARY REPORT.
L. E. Donelan. 30 Jun 73, 24p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, Electric cables), (*Electric cables, *Design), Dielectric materials, Performance testing.

For abstract, see NSA 28 07, number 17482.

AI-AEC-13091/GA PC$6.25/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
SPACE NUCLEAR SYSTEM THERMOELECTRIC NAK PUMP DEVELOPMENT. SUMMARY REPORT.
J. L. Johnson. 30 Jun 73, 85p NASA-CR-121231
Contract AT(04-3)-701

Descriptors: (*Snap reactors, Electromagnetic pumps), (*S2 reactor, Electromagnetic pumps), (*S10 reactor, Electromagnetic pumps), (*Electromagnetic pumps, *Design), Fabrication, Nak cooled reactors, Performance testing, Thermoelectric generators.

For abstract, see NSA 28 07, number 17483.

AI-AEC-13093/GA PC$15.00/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
DESIGN AND ANALYSIS OF THE RADIATOR STRUCTURE FOR SPACE POWER SYSTEMS.
W. H. Dauterman, and L. D. Montgomery. 22 Jun 73, 257p NASA-CR-121222
Contract AT(04-3)-701

Descriptors: (*Snap reactors, Radiators), (*Radiators, *Design), Aluminium alloys, Beryllium base alloys, Fabrication, Fins, Performance testing, Space power reactors, Stainless steel-304, Stress analysis, Tubes.

For abstract, see NSA 28 08, number 20337.

AI-AEC-13102/GA PC$5.75/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
MATERIALS INTERACTIONS BETWEEN THE THERMOELECTRIC CONVERTER AND THE 5-KWE REACTOR SYSTEM.
P. B. Ferry. 30 Jun 73, 72p NASA-CR-121230
Contract AT(04-3)-701

Descriptors: (*Snap reactors, *Primary coolant circuits), (*Stainless steel-316, *Mechanical properties), (*Tantalum base alloys, *Corrosion), (*Tungsten alloys, Corrosion), Pipe joints, Temperature dependence, Thermal stresses, Thermoelectric generators.

For abstract, see NSA 28 07, number 17484.

N-72-11535/GA PC$7.60/MF$1.45
Aerojet Nuclear Systems CO., Azusa, Calif. (Usa).
SNAP-8 POWER CONVERSION SYSTEM DESIGN REVIEW.
L. P. Lopez. Jun 70, 261p NASA-CR-72945, AGC-4017

Descriptors: (*S8 reactor, *Electric generators), Design, Performance, Radiators, Snap reactors, Specifications.

For abstract, see NSA 28 07, number 17485.

N-73-11696/GA PC$5.45/MF$1.45
General Electric CO., Philadelphia, PA. Missile and Space Div.
MANNED SPACE FLIGHT NUCLEAR SYSTEM SAFETY. VOLUME 3. REACTOR SYSTEM PRELIMINARY NUCLEAR SAFETY ANALYSIS. PART 1. REFERENCE DESIGN DOCUMENT (RDD). FINAL REPORT.
Jan 72, 99p NASA-CR-123844
Contract NAS8-26283

Descriptors: (*Snap reactors, *Reactor safety), (*Space power reactors, Reactor safety), Brayton cycle, Design, Launching, Space vehicles, Zirconium hydrides.

For abstract, see NSA 28 07, number 17509.

N-73-11697/GA PC$7.60/MF$1.45
General Electric CO., Philadelphia, PA. Missile and Space Div.
MANNED SPACE FLIGHT NUCLEAR SYSTEM SAFETY. VOLUME 3. REACTOR SYSTEM PRELIMINARY NUCLEAR SAFETY ANALYSIS. PART 2. ACCIDENT MODEL DOCUMENT (AMD). FINAL REPORT.
Jan 72, 309p NASA-CR-123839
Contract NAS8-26283

Descriptors: (*Snap reactors, *Reactor safety), (*Space power reactors, Reactor safety), Brayton cycle, Launching, Personnel, Radiation hazards, Radiation protection, Reactor accidents, Recommendations, Space flight, Space vehicles, Zirconium hydrides.

For abstract, see NSA 28 07, number 17510.

N-73-11699/GA PC$5.45/MF$1.45
General Electric CO., Philadelphia, PA. Missile and Space Div.
MANNED SPACE FLIGHT NUCLEAR SYSTEM SAFETY. VOLUME 3. REACTOR SYSTEM PRELIMINARY NUCLEAR SAFETY ANALYSIS. PART 3. NUCLEAR SAFETY ANALYSIS DOCUMENT (NSAD). FINAL REPORT.
Jan 72, 142p NASA-CR-123846
Contract NAS8-26283

Descriptors: (*Space power reactors, *Reactor safety), (*Snap reactors, Reactor safety), Fission products, Launching, Man, Personnel, Radiation hazards, Radiation protection, Reactor accidents, Recommendations, Reentry, Space vehicles.

For abstract, see NSA 28 07, number 17511.

N-73-11700/GA PC$7.60/MF$1.45
General Electric CO., Philadelphia, PA. Missile and Space Div.
MANNED SPACE FLIGHT NUCLEAR SYSTEM SAFETY. VOLUME 4. SPACE SHUTTLE NUCLEAR SYSTEM TRANSPORTATION. PART 1. SPACE SHUTTLE NUCLEAR SAFETY. FINAL REPORT.
Jan 72, 196p NASA-CR-123847
Contract NAS8-26283

Descriptors: (*Snap reactors, *Reactor safety), (*Space power reactors, Reactor safety), (*Snap batteries, *Safety), Brayton cycle, Design, Space flight, Space vehicles, Transport, Zirconium hydrides.

For abstract, see NSA 28 07, number 17512.

N-73-11701/GA PC$7.60/MF$1.45
General Electric CO., Philadelphia, PA. Missile and Space Div.
MANNED SPACE FLIGHT NUCLEAR SYSTEM SAFETY. VOLUME 5. NUCLEAR SYSTEM SAFETY GUIDELINES. PART 1. SPACE BASE NUCLEAR SAFETY. FINAL REPORT.
Jan 72, 217p NASA-CR-123848
Contract NAS8-26283

Descriptors: (*Space power reactors, *Reactor safety), (*Snap reactors, Reactor safety), (*Snap batteries, *Safety), Indexes, Radiation protection, Recommendations, Space flight, Space vehicles.

For abstract, see NSA 28 07, number 17513.

N-73-11702/GA PC$5.45/MF$1.45
General Electric CO., Philadelphia, PA. Missile and Space Div.
MANNED SPACE FLIGHT NUCLEAR SYSTEM SAFETY. VOLUME 5. NUCLEAR SYSTEM SAFETY GUIDELINES. PART 2. SPACE SHUTTLE/NUCLEAR PAYLOADS SAFETY. FINAL REPORT.
Jan 72, 130p NASA-CR-123843
Contract NAS8-26283

Descriptors: (*Space power reactors, *Reactor safety), (*Snap batteries, *Safety), (*Snap reactors, Reactor safety), Brayton cycle, Design, Indexes, Manuals, Recommendations, Space flight.

For abstract, see NSA 28 07, number 17514.

N-73-11704/GA PC$5.45/MF$1.45
General Electric CO., Philadelphia, PA. Missile and Space Div.
MANNED SPACE FLIGHT NUCLEAR SYSTEM SAFETY. VOLUME 7. LITERATURE REVIEW. PART 1. LITERATURE SEARCH AND EVALUATION. FINAL REPORT.
Jan 72, 78p NASA-CR-123850
Contract NAS8-26283

Descriptors: (*Space power reactors, *Reactor safety), (*Space flight, *Bibliographies), (*Snap reactors, Reactor safety), Personnel, Radiation protection.

For abstract, see NSA 28 07, number 17516.

N-73-16641/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
810 FT/SEC SOIL IMPACT TEST OF A 2-FOOT DIAMETER MODEL NUCLEAR REACTOR CONTAINMENT SYSTEM.
R. L. Puthoff. Dec 72, 22p NASA-TM-X-68180, E-7275

Descriptors: (*Space power reactors, Containment shells), (*Snap reactors, Containment shells), (*Containment shells, *Impact tests), Impact shock, Performance testing.

For abstract, see NSA 28 07, number 17517.

NAA-SR-11884/GA PC$5.00/MF$1.45
Atomics International, Canoga Park, Calif.
PROGRESS REPORT SNAP AEROSPACE NUCLEAR SAFETY PROGRAM, JANUARY--MARCH 1966.
R. L. Detterman. 15 May 66, 57p
Contract AT(11-1)-Gen-8

Descriptors: (*S8 reactor, *Reactor safety), (*Snaptran reactors, *Transients), Ablation, Burnup, Design, Nuclear fuels, Reactor shutdown, Reentry, Testing.

For abstract, see NSA 28 08, number 20338.

NAA-SR-8092/GA PC$11.25/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP 8 QUARTERLY PROGRESS REPORT, OCTOBER--DECEMBER 1962.
C. E. Johnson. 20 May 63, 182p
Contract AT(11-1)-GEN-8

Descriptors: (*S8er reactor, *Research programs), (*S8dr reactor, Research programs), Design, Fuel elements, Testing.

For abstract, see NSA 28 07, number 17490.

NAA-SR-9720/GA PC$6.25/MF$1.45
Atomics International, Canoga Park, Calif.
SNAP 10A PRESTARTUP AND STARTUP PERFORMANCE.
G. S. Drucker, and T. J. Boyle. 30 Jun 64, 84p
Contract AT(11-1)-GEN-8

Descriptors: (*S10 reactor, *Reactor start-up), Computer calculations, Hydraulics, Mathematical models, Performance, Reactor kinetics, Thermal analysis.

For abstract, see NSA 28 07, number 17491.

N73-30508/8GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MATERIALS TECHNOLOGY PROGRAMS IN SUPPORT OF A MERCURY RANKINE SPACE POWER SYSTEM.
P. L. Stone. Sep 73, 48p NASA-TN-D-7355, E-7382

Descriptors: *Materials tests, *Rankine cycle, *Snap 8, Mechanical properties, Mercury (Metal), Potassium alloys, Sodium alloys, Stainless steels, Tantalum.

For abstract, see STAR 1121

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-768 707/2GA PC$2.75/MF$1.45
Harry Diamond Labs Washington D C
A GUIDE FOR SELECTING HIGH-VALUE CAPACITORS FOR FUZE APPLICATIONS,
Henry W. Gilliand. Jun 73, 13p Rept no. HDL-TM-73-12

Descriptors: (*Capacitors, *Fuzes(Ordnance)), Tantalum capacitors, Ceramic capacitors, Electrolytic capacitors, Electrolytes.

Guidelines were established to facilitate the selection of high-value capacitors for ordnance fuzing and other military applications. Background information has been compiled on the electrical and physical properties of ceramic capacitors rated to 10 microfarads and electrolytic capacitors rated in thousands of microfarads, either of which is also available in ratings below one microfarad. Standard dc working voltages range from 25 to 1000 volts for the ceramics and from 6 to 600 volts for the electrolytics. Since the report is concerned primarily with fuzing applications, only the high-K ceramic and tantalum dielectric capacitors are discussed in any detail. The high-voltage ceramics and aluminum electrolytics are included mainly for comparison. (Author)

AD-768 776/7GA PC$3.00/MF$1.45
Picatinny Arsenal Dover N J
REPORT ON PRELIMINARY FAILURE INVESTIGATION OF XM509/M577 SYSTEM AND RECOMMENDATIONS FOR IN-DEPTH STUDY.
Technical rept.,
Gerard G. Lowden, and Frederick R. Tepper. Aug 73, 50p Rept no. PA-TR-4545

Descriptors: (*Projectile fuzes, Failure(Mechanics)), Fuze functioning elements, Time-delay fuzes, Exterior ballistics, Vibration, Friction, Firing tests(Ordnance), Howitzers.
Identifiers: M-509 projectiles, XM-509 projectiles, M-577 fuzes.

The failure history of the FFE mode of the XM509/M577 system is reviewed together with the results of the investigations which lead to a workable solution to the problem. Since there is some evidence that structural vibrations are causing the malfunctions, an in-depth study of the structural responses of the XM509/M577, M483/M577 and M106/M577 system, together with an associated test program, is recommended in order to provide a more complete understanding of the phenomona. (Author)

AD-768 778/3GA MF$1.45
Picatinny Arsenal Dover N J
EXAMINATION OF UNFIRED 75 MM. A.P.C., H.E. PROJECTILE COMPLETE ROUND OF GERMAN AMMUNITION (FMAM-289).
Technical rept. no. 1 (Final),
A. B. Schilling. 5 Jun 44, 16p Rept no. PA-TR-1421
Availability: Available in microfiche only.

Descriptors: (*Projectiles, Design), Projectile caps, Projectile cases, Propelling charges, Chemical analysis, Projectile fuzes, Rotating bands, Complete rounds.
Identifiers: PAK 40 guns(75-MM).

An unfired German 75 mm. A.P.C., H.E. Projectile Complete Round, for the Pak 40 Gun, was subjected to technical examination. The complete round consists of a capped armor piercing projectile with windshield, of conventional design, crimped in a primed steel cartridge case. The projectile is loaded with a rpessed cyclonite charge consisting of 89.7% cyclonite and 10.3% wax. A

base detonating fuze, with tracer, is assembled in the base of the projectile. The cartridge case contains a propelling charge of double base (nitrocellulose-DEGN) powder in long cords, with igniter of nitrocellulose-DEGN powder, and a short percussion type primer.

AD-768 907/8GA PC$6.25/MF$1.45
Vehicle Research Corp San Gabriel Calif
HIGH PERFORMANCE HOLLOW PROJECTILES.
Final technical rept.,
Scott Rethorst, Tooshio Fujita, J. J. Wu, E. R. Sargent, and Robert Berlot. 17 Aug 73, 83p Rept no. VRC-26
Contract DAAD05-72-C-0296, ARPA Order-1575

Descriptors: (*Sabot projectiles, Performance(Engineering)), Design, Aerodynamic characteristics, Firing tests(Ordnance), Projectile trajectories, Penetration.
Identifiers: Hollow projectiles.

Development of hollow projectiles was first advocated to achieve 'silent' (low pressure signal) projectiles having higher performance. Although the present effort concentrates on small arms (specifically 7.62 mm), the confirmed fundamental theory applies to all sizes of hollow projectiles. The report can thus serve as a basis for (1) evaluating specific hollow projectile developments and (2) formulating programs to develop a wide spectrum of hollow projectile configurations tailored to a diversity of functional requirements.

AD-768 915/1GA MF$1.45
Picatinny Arsenal Dover N J
EXAMINATION OF UNFIRED 47 MM. A.P., H.E. (LONG NOSE) COMPLETE ROUND OF ITALIAN AMMUNITION.
Technical rept. no 1 (Final).
11 Mar 43, 11p Rept no. PA-TR-1241
Availability: Available in microfiche only.

Descriptors: (*Projectiles, Design), Italy, Projectile cases, Projectile fuzes, Propelling charges, Complete rounds, Armor piercing ammunition.

One 47 mm. A.P., H.E. Complete Round of Italian Ammunition was received for examination. The complete round consists of an uncapped armor piercing projectile, with windshield, assembled in a primed brass cartridge case. The projectile is loaded with an Ammonium Nitrate - Cyclonite bursting charge and fuzed with a base detonating fuze containing a tracer. The cartridge case contains a double base strip type propelling charge with a black powder igniter and a short aluminum dummy primer.

AD-769 071/2GA PC$3.50/MF$1.45
Redm Corp Wayne N J
MODULAR BALL AND HELIX SETBACK MECHANISM.
Final rept.,
Lowell K. Koeberle, and David L. Overman. Aug 73, 65p HDL-2009-1
Contract DAAG39-71-C-2009

Descriptors: (*Arming devices, Design), (*Projectile fuzes, Arming devices), Fuze functioning elements, Sensors, Accelerometers, Firing tests(Ordnances), Computer programs.

The design and performance of a ball and helix double intergrating acceleration mechanism is discussed. This device can be used to provide setback safety for projectile fuzing or mechanical and electrical functions in terradynamics penetration vehicles and long delay mine and bomb fuzes. Units were built and tested having a volume of 0.07 cubic inches, a scale factor of 14.4 to 1, a bias level of 500g's, and an operating threshold of 110 FPS velocity change and 4 inches displacement. Work under a prior contract is summarized, results of laboratory air gun and 81mm mortar field tests are given, and an advanced design is described. Mathematical analysis and correlation with experiments plus detail design drawings are presented in 2 appendices. It is concluded that the ball and helix mechanism is a feasible device and recommendations are made for a final phase of exploratory development. (Author)

BNWL-SA-4579/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
APPLICATION OF THE EDDY CURRENT METHOD TO HIGH SPEED THICKNESS MEASUREMENT.
J. C. Crowe, H. L. Libby, and J. R. Skorpik. 14p CONF-730451-1

Descriptors: (*Explosives, *Eddy current testing), Brass, Cylindrical configuration, Thickness.

For abstract, see NSA 28 08, number 20606.

N73-30840/5GA PC$3.75/MF$1.45
McDonnell Aircraft Co., St. Louis, Mo.
A STUDY OF THE ROLE OF PYROTECHNIC SYSTEMS ON THE SPACE SHUTTLE PROGRAM.
E. R. Lake, S. J. Thompson, and V. W. Drexelius. Sep 73, 97p NASA-CR-2292
Contract NAS1-10892

Descriptors: *Explosive devices, *Pyrotechnics, *Space shuttles, *Spacecraft components, Burning rate, Flammability, Materials tests, Spacecraft design, Systems analysis.

For abstract, see STAR 1121

PAT-APPL-392823/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
REMOTE FIRE STACK IGNITER.
Patent Application.
W. L. Ray. Filed 29 Aug 73, 16p NASA-CASE-MFS-21675-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Igniters, *Stacks, Chimneys, Patent applications, Solenoid valves.

An igniter mounted on a vent stack is described with an upper, flame case near the top of the stack to ignite emissions from the stack. The igniter is a tube with a lower, open, flared end having a spark plug near the lower end and a solenoid-controlled valve which supplies propane fuel from a supply tanks. Propane from the tank is supplied at the top under control of a second, solenoid-controlled valve. The valve controlling the lower supply is closed after ignition at the flame cage.

PB-223 769/1GA PC$4.25/MF$1.45
General Electric Co., Bay Saint Louis, Miss. Hazards Evaluation, Research and Engineering.
HAZARD CLASSIFICATION OF EXPLOSIVES FOR TRANSPORTATION EVALUATION OF TEST METHODS.
Final rept.,
P. V. King, Sr., and A. H. Lasseigne. May 72, 121p GE-HERE-FR-006 TSA-20-72-5
Contract DOT-AS-10057

Descriptors: (*Explosives, Classifications), (*Hazardous materials, Transportation), Safe handling, Impact, Sensitivity, Cost estimates, Electrostatic fields, Burning rate, Ignition, Hazards.
Identifiers: Hazardous materials transportation, Hazard classification.

Present explosive classification methodology does not consider the environmental conditions experienced by explosive cargos, specifically, the interaction between stimuli and environmental parameters. Results of this investigation are reflected as recommended preliminary guidelines for the commercial and military transportation classification of various explosive or near explosive (fast reacting) materials. Specifically, recommendations are made for environmental parameters appropriate to explosives in the transportation modes, classification test methods for explosives, and classification of selected materials as a result of testing contained herein.

19B. Bombs

AD-768 709/8GA PC$2.75/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
ANALYSIS OF VAPORS EMITTED FROM MILITARY MINES.
Special rept.,
T. F. Jenkins, W. F. O'Reilly, R. P. Murrmann, D. C. Leggett, and C. I. Collins. Sep 73, 18p Rept no. CRREL-SR-193

Descriptors: (*Mine detectors, *Gas analysis), (*Mines(Ordnance), Vapors), Chemical analysis, Cyclohexanones, Gas chromatography, Mass spectrum, TNT, Explosive materials.

The vapor evolving from several types of intact military mines was analyzed using gas chromatography and gas chromatography/mass spectroscopy. Cyclohexanone was positively identified in the vapor from M15 (metallic) and M19 (nonmetallic) antitank mines. This compound originates from composition B, the explosive used in these mines. Acetone, toluene and an unknown organo-silicon compound were identified and are attributable to the nonmetallic mine casings. Although positive mass spectral identification is lacking, chromatographic data obtained using an electron capture detector indicated that 2, 4, 6 trinitrotoluene was detected in the vapor from the M16 (metallic) antipersonnel mines which are loaded with TNT. (Author)

19C. Combat Vehicles

AD-768 405/3GA PC$3.75/MF$1.45
Stevens Inst of Tech Hoboken N J Davidson Lab
AUTOMATIC PATH SPECIFICATION FOR THE AMC 71 MOBILITY MODEL.
Final rept.,
M. Peter Jurkat. Sep 73, 83p Rept no. SIT-DL-73-1658
Contract DAAE07-73-C-0056

Descriptors: (*Terrain, Trafficability), (*Vehicles, Terrain), Rivers, Maps, Terrain models, Mobility, Mathematical models, Computer programs.
Identifiers: AMC 71 vechiles, Soil tire interactions.

The report contains the description of a computer-based method for determining the family of routes from which the route selection program of the AMC 71 mobility model can choose to determine the minimum-travel-time path of a vehicle over some terrain. It specifies what data and in what format it must be presented in order for the computer programs to construct a file that the route selection program needs. Currently, the method is restricted to rectangular maps. The family of paths, which includes lateral path segments, can be altered without repeating the laborious initial work required to digitize and compile the map description. Also included is a brief study of the effects of changing the parameters of the path family on the overall transverse time of several vehicles. (Author)

19D. Explosions, Ballistics, and Armor

AD-768 708/0GA PC$3.50/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md

EVALUATION OF THE COMPUTER CODES BLAST, DORF, HELP AND HEMP FOR SUITABILITY OF UNDEREXPANDED JET FLOW CALCULATION,
Csaba K. Zoltani. Aug 73, 62p Rept no. BRL-1659

Descriptors: (*Exterior ballistics, Mathematical models), (*Gun barrels, Blast), Flow fields, Flow visualization, Numerical analysis, Pressure, Shock waves.
Identifiers: Computerized simulation, Muzzle blast, M-16 guns(5.56-MM), BLAST computer code, DORF computer code, HELP computer code, HEMP computer code.

The computer codes BLAST, DORF, HELP and HEMP have been used to simulate the flow field at the muzzle of a M-16 rifle, without any deflectors, compensators, or flash hiders. The flow was modeled as an underexpanded jet, of a compressible, inviscid and non-reactive gas. The calculations, restricted to the initial stages of formation of the jet were done on a cylindrically symmetric geometry without the presence of a flow obstruction in the form of a projectile. Results are presented as pressure contours as well as pressure and velocity profiles at different angles from the centerline of the muzzle of the barrel, and plots of pressure versus distance from the muzzle. The calculations are compared with available photographic records of the process. (Author)

AD-768 788/2GA PC$4.50/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
OPERATION MINE SHAFT: DISTRIBUTION OF NATURAL AND ARTIFICIAL EJECTA RESULTING FROM DETONATION OF 100-TON TNT CHARGE ON GRANITE: MINERAL ROCK EVENT.
Final rept.,
John W. Meyer, and Allen D. Rooke, Jr. Sep 73, 145p Rept no. AEWES-Misc-Paper-N-73-4
Report on M. S. series no. MS-2152.

Descriptors: (*Cratering, Granite), TNT, Underground structures, Explosion effects, Guided missiles, Aerial photography, Simulation.
Identifiers: *Ejecta, Ground motion, Mineral rock shot, Mine Shaft operation.

Event Mineral Rock, the detonation of a 100-ton spherically shaped charge of TNT on granite, was the last event of the Mine Shaft Series, a program of high-explosive tests primarily concerned with ground shock and cratering effects from explosions at or near the surface of a competent rock medium. The series, conducted in 1968 and 1969, was intended as a follow-on to previously conducted similar experiments in soil. Mineral rock (1969) duplicated the geometry and yield of Event Mine Ore (1968). Studies of crater ejecta were conducted to determine debris density and distribution, to examine the role of the ejection mechanism in crater formation, and to obtain additional information on the hazards associated with natural missiles. Mineral Rock, with a maximum observed ejecta range of approximately 2,800 feet for a 1-pound particle, produced a larger crater and a more extensive ejecta field than its predecessor, Mine Ore. (Modified author abstract)

LA-UR-73-91/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
TWO DIMENSIONAL FLOW OF DETONATIONS PROCEEDING PERPENDICULAR TO CONFINED AND UNCONFINED SURFACES.
C. L. Mader. 1973, 19p CONF-730702-1

Descriptors: (*Shock waves, *Two-dimensional calculations), (*Computer codes, *Number codes), Explosions, Lagrange equations, Surfaces.

For abstract, see NSA 28 08, number 20576.

N73-30865/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
CORRELATION OF NEW HYPERVELOCITY IMPACT DATA BY THRESHOLD PENETRATION RELATIONS.
R. J. Hayduk, P. S. Gough, and E. Alfaro-bou. Sep 73, 29p NASA-TN-D-7308, L-8911

Descriptors: *Aluminum, *Hypervelocity impact, *Hypervelocity projectiles, *Metal plates, *Terminal ballistics, Data acquisition, Impact damage, Spheres.

For abstract, see STAR 1121

N73-31845/3GA PC$3.50/MF$1.45
Institut fuer Chemie der Treibstoffe, Berghausen (West Germany).
THERMOCHEMICAL ANALYSIS OF HEXOGEN/METAL MIXTURESTHERMOCHEMISCHE UNTERSUCHUNGEN AN HEXOGEN/METALL - GEMISCHEN.
A. Pfeil. 31 Dec 72, 26p ICT-12/72
Language in German.

Descriptors: *Aluminum, *Bomb calorimeters, *Explosives, *Hexogenes (Trademark), *Tungsten, Chemical reactions, Reactivity, Thermochemistry.

For abstract, see STAR 1122

19E. Fire Control and Bombing Systems

AD-768 713/0GA PC$5.75/MF$1.45
Army Weapons Command Rock Island Ill General Thomas J Rodman Lab
THE FUE (FIRE UNIT EFFECTIVENESS) AIR DEFENSE GUN EVALUATION PROGRAM.
Final rept.,
Fred L. Bunn. Jul 73, 227p Rept no. AMSWE-R-RR-S-4-72-73 AMSAA-Internal Note-A-47

Descriptors: (*Antiaircraft defense systems, *Antiaircraft gunnery), (*Computer programs, *Instruction manuals), Antiaircraft guns, Antiaircraft fire control systems, Man-machine systems, Subroutines, Probability, Mathematical models.
Identifiers: FUE computer program, Vulcan guns, Miniguns, Computerized simulation, FORTRAN 4 programming language, FORTRAN.

The Fire Unit Effectiveness (FUE) model is a computer program. It simulates, in Monte Carlo fashion, one air defense gun firing at one maneuvering aircraft. Three of the submodels simulate the real world to an extent not known in previous air defense models. These submodels simulate visual detection, the VULCAN sight current generator, and the VULCAN man-machine dynamic interaction. The report is a programmer's manual. It discusses the inner workings of the model in detail, and makes it possible for other users to modify the program or cannabalize it. (Author)

AD-768 985/4GA PC$4.75/MF$1.45
Stanford Research Inst Menlo Park Calif
A SURVEY OF DIRECT-FIRE ASSESSMENT TECHNIQUES FOR CDEC.
Special rept. no. 1,
K. W. Gardiner, and G. L. Pressman. Mar 60, 53p
Contract DA-04-351-AVI-1731

Descriptors: (*Fire control systems, Simulators), Infrared equipment, Gunnery, Detection, Signal-to-noise ratio, Background, Surface targets, Tanks(Combat vehicles).
Identifiers: Hit detection.

Five possible methods for designing direct-fire weapon simulation and hit detection equipment are studied. The most promising method is based on the use of infrared radiation. Two techniques using infrared are examined in detail. The resulting calculations provide the basis for constructing an experimental test system for field measurements and evaluation. (Author)

19F. Guns

AD-768 700/7GA PC$3.50/MF$1.45
Defense Documentation Center Alexandria Va
EROSION IN GUN BARRELS.
Report bibliography Mar 36-Jan 73.
Oct 73, 68p* Rept no. DDC-TAS-73-61

Descriptors: (*Gun barrels, *Erosion), (*Bibliographies, Gun barrels), Degradation, Ammunition propellants, Additives, Interior ballistics, Corrosion inhibition, Electroplating, Nondestructive testing, Cooling.

The bibliography is a compilation of references pertaining to Erosion in Gun Barrels. Corporate Author-Monitoring Agency, Subject, Title, Personal Author, Contract, and Report Number indexes are included. (Author)

19G. Rockets

AD-768 774/2GA PC$3.50/MF$1.45
Army Missile Command Redstone Arsenal Ala Ground Equipment and Materials Directorate
METHODS FOR REDUCING VIBRATIONS OF EQUIPMENT MOUNTED ON HELICOPTER EXTERNAL STORES STATIONS.
Technical rept.,
James M. Oliver. 6 Aug 73, 57p Rept no. RL-TR-73-6

Descriptors: (*Rocket launchers, Vibration), (*Helicopters, External stores), Damping, Vibration isolators, Oscillation, Design, Mathematical models, Test equipment.
Identifiers: H-1 aircraft, AH-1G aircraft, Huey Cobra, Analog simulation, Computer aided design.

Three designs for reducing the vertical oscillations induced in equipment mounted on the wings of AH-1G helicopters are submitted. A design for a variable stiffness spring to accommodate a change in the mass of the system to be isolated is presented. By use of an analog simulation of a dynamic absorber it is shown that a dynamic absorber is not satisfactory for small ratios of damper mass to system mass. An experimental program is formulated to determine the dynamic properties of a test fixture to be used in determining isolator effectiveness. (Author)

20. PHYSICS

20A. Acoustics

AD-768 847/6GA PC$3.00/MF$1.45
Federal Aviation Administration Washington D C Office of Systems Engineering Management
ENGINEERING AND DEVELOPMENT PROGRAM PLAN - AIRCRAFT NOISE AND SONIC BOOM.
Jun 73, 38p Rept no. FAA-ED-20-2

Descriptors: (*Airplane noise, Acoustic impedance), Jet plane noise, Sonic boom, Engine noise, Stress(Physiology), Tolerances(Physiology), Law, Advanced planning.
Identifiers: Noise levels, Noise exposure, Noise abatement, Noise reduction, Noise pollution, Environmental noise exposure measurement.

The report describes a program plan designed to provide a data base from which to develop rule making for control and abatement of aircraft noise and sonic boom. Primary objectives are to

minimize the environmental impact of aircraft generated noise and sonic boom and to develop prediction, reduction and certification criteria for all categories of aircraft. Development activities currently in progress plus programs planned for a period of approximately five years are described. (Author)

AD-768 895/5GA PC$4.50/MF$1.45
Stanford Univ Calif Microwave Lab
MICROWAVE RESEARCH.
Annual status rept. no. 6, 1 Jun 72-31 May 73, Oct 73, 146p Rept no. ML-2170
Contract N00014-67-A-0112-0039

Descriptors: (*Acoustics, Scientific research), Pumps, Fuel cells, Acoustic detectors, Cells(Biology), Cell structure, Delay lines, Video signals, Ultrasonic radiation, Touch, Waveguides.
Identifiers: *Acoustic surface waves, Microwave acoustics, Acoustic delay lines, Signal processing, Bioinstrumentation, Thin films, Acoustic delay lines, Robots, Acoustic waveguides, Ultrasonic tests.

Contents:
- Acoustic pumping of fluids;
- Fuel cell research;
- Signal processing with acoustic surface waves;
- Acoustic waves on nonpiezoelectric materials;
- Acoustic methods for cell discrimination;
- Signal transformation with recirculating delay lines;
- Electronic scanning and focusing of acoustic beams;
- Acoustic tactile sensing;
- Rotation sensing with acoustic waves;
- Acoustic waveguide theory;
- Acoustic absorption spectra of biological materials.

AD-768 922/7GA PC$3.25/MF$1.45
J G Engineering Research Associates Baltimore Md
A SIMPLIFIED REPRESENTATION OF CYLINDRICAL SHELL RADIATION UNDER CONCENTRATION FORCES,
Joshua E. Greenspon. Mar 73, 25p Rept no. 0-73-1
Contract N00014-71-C-0115

Descriptors: (*Structural shells, Acoustic properties), (*Vibration, Structural shells), Stiffened cylinders, Loading(Mechanics), Transfer functions, Computer programs.
Identifiers: Far field, *Cylindrical shells.

The report presents the relationships for random noise radiated by concentrated forces exciting a shell. The mathematical model of the infinitely long stiffened cylindrical shell is employed to compute the radiation patterns for point forces exciting the shell. The behavior is traced from very low to very high frequencies. The shell acts as a dipole at low frequency. As the frequency is increased higher lobes enter the picture until finally at very high frequency the 'rabbit ear' behavior predicted for plates is predominant. (Author)

COM-73-50862/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SOME SOUND VELOCITY MEASUREMENTS ON LIQUID FLUORINE.
Final rept.,
G. C. Straty, and B. A. Younglove. 1973, 2p
Contract F04611-70-X-0001
Sponsored in part by Air Force Rocket Propulsion Lab., Edwards AFB, Calif.
Pub. in Jnl. of Chemical Physics, v58 n5 p2191-2192, 1 Mar 73.

Descriptors: (*Liquid fluorine, *Acoustic velocity).

Some sound velocity measurements on liquid fluorine at 110 K at pressures to 21 MN/sq m are reported.

N73-30007/1GA PC$5.25/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
REVIEW OF SONIC BOOM.
N. W. Page, and A. S. Kaye. Feb 73, 63p ARL/A-NOTE-337, ARL/A-TM-254
Misc-Supersedes Arl/a-TM-254.

Descriptors: *Physiological effects, *Shock waves, *Sonic booms, *Sound waves, *Structural stability, Aerodynamic noise, Overpressure, Supersonic flight, Wave propagation.

For abstract, see STAR 1121

N73-30024/6GA PC$4.25/MF$1.45
Boeing Co., Seattle, Wash. Commercial Airplane Group.
A STATUS REPORT ON JET NOISE SUPPRESSION AS SEEN BY AN AIRCRAFT MANUFACTURER.
W. C. Swan, and C. D. Simcox. 1972, 42p
Subm-Sponsored by Aeron. And Astronaut. Assoc. Of France and Soc. Of Mech. Engr. Of France. Conf-Presented at 1ST Intern. Symp. On Air Breathing Engines, Marseille, 19-22 Jun. 1972.

Descriptors: *Acoustic properties, *Aircraft equipment, *Jet aircraft noise, *Noise reduction, *Sound intensity, Aerodynamic characteristics, Short takeoff aircraft, Supersonic aircraft, Transport aircraft.

For abstract, see STAR 1121

N73-30029/5GA PC$4.00/MF$1.45
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris (France).
STUDIES OF THE INFLUENCE OF DENSITY ON JET NOISE.
R. G. Hoch, J. P. Duponchel, B. J. Cocking, and W. D. Bryce. 1972, 36p
Conf-Presented at the 1ST Intern. Symp. On Air Breathing Engines, Marseille, 19-23 Jun. 1972.

Descriptors: *Acoustic properties, *Engine noise, *Jet aircraft noise, *Jet exhaust, Computer programs, Numerical analysis, Sound intensity.

For abstract, see STAR 1121

N73-30031/1GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
RESULTS OF THE NOISE MEASUREMENT PROGRAM ON A STANDARD AND MODIFIED OH-6A HELICOPTER.
H. R. Henderson, R. J. Peegg, and D. A. Hilton. Sep 73, 105p NASA-TN-D-7216, L-8129

Descriptors: *Acoustic measurements, *Aerodynamic noise, *Noise reduction, *Oh-6 helicopter, Acoustic attenuation, Aerodynamic configurations, Flight tests.

For abstract, see STAR 1121

N73-30088/1GA PC$3.00/MF$1.45
Techtran Corp., Silver Spring, Md.
SANITATION NORMS OF PERMISSIBLE NOISE IN LIVING ACCOMMODATIONS, PUBLIC BUILDING, AND IN THE TERRITORY OF HABITABLE BUILDINGS.
P. N. Burgasov. Aug 73, 16p NASA-TT-F-15065
Contract NASW-2485
Tran-Transl. Into English of the Publ. "Sanitarnyye Normy Dopustimogo Shuma V Pomeshcheniyakh Zhilykh I Obshchestvennykh Zdaniu I NA Territorii Zhiloy Zastroyki" Moscow, Min. Of Public Health, 1971 13 p.

Descriptors: *Acoustic measurements, *Noise (Sound), *Standards, Continuous noise, Hospitals, Noise intensity, Residential areas, Tables (Data).

For abstract, see STAR 1121

N73-30231/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A MODEL FOR THE PRESSURE EXCITATION SPECTRUM AND ACOUSTIC IMPEDANCE OF SOUND ABSORBERS IN THE PRESENCE OF GRAZING FLOW.
E. J. Rice. 1973, 11p NASA-TM-X-71418, E-7656
Conf-Proposed for Presentation at AERO-Acoustics Conf., Seattle, Wash., 15-17 Oct. 1973; Sponsored by Aiaa.

Descriptors: *Acoustic impedance, *Acoustic measurements, *Flow characteristics, *Jet flow, *Sound transmission, Acoustic excitation, Pressure effects.

For abstract, see STAR 1121

N73-30241/6GA PC$3.50/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
EXPERIMENTAL EVALUATION OF FLUCTUATING DENSITY AND RADIATED NOISE FROM A HIGH TEMPERATURE JET.
P. F. Massier, S. P. Parthasarathy, and R. F. Cuffel. 1 Oct 73, 29p NASA-CR-133789, JPL-TM-33-643
Contract NAS7-100
Conf-Presented at the AGARD Fluid Dyn. Panel Meeting, Brussels, 19-21 Sep. 1973.

Descriptors: *Acoustic measurements, *Acoustic properties, *Jet flow, *Sound propagation, *Sound transmission, Flow distribution, High temperature environments, Subsonic flow.

For abstract, see STAR 1121

N73-30668/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NOISE COMPARISONS FROM FULL-SCALE FAN TESTS AT NASA LEWIS RESEARCH CENTER.
M. F. Heidmann, and C. E. Feiler. 1973, 20p
NASA-TM-X-68289, E-7637
Conf-Proposed for Presentation at the AERO-Acoustics Conf., Seattle, 15-17 Oct. 1973; Sponsored by Aiaa.

Descriptors: *Acoustic measurements, *Aerodynamic characteristics, *Performance tests, *Turbofans, Broadband, Full scale tests, Noise spectra, Nozzle efficiency.

For abstract, see STAR 1121

N73-30669/8GA PC$8.50/MF$1.45
El-Sum Consultants, Atherton, Calif.
DIAGNOSTIC TECHNIQUES FOR MEASUREMENT OF AERODYNAMIC NOISE IN FREE FIELD AND REVERBERANT ENVIRONMENT OF WIND TUNNELS.
H. M. A. El-sum, and O. K. Mawardi. May 73, 126p NASA-CR-114636
Contract NAS2-6872

Descriptors: *Aerodynamic noise, *Engine noise, *Free flight, *Noise generators, *Wind tunnels, Antenna design, Engine tests, Jet aircraft noise, Reverberation.

For abstract, see STAR 1121

N73-31023/7GA PC$3.25/MF$1.45
Royal Naval Personnel Research Committee, London (England).
PERCEPTUAL CONFUSIONS BETWEEN FOUR-DIMENSIONAL SOUNDS.
J. C. Webster, M. M. Woodhead, and A. Carpenter. Aug 71, 23p OES-6/72, BR-35741

Descriptors: *Audio frequencies, *Auditory perception, *Speech, *Speech recognition, Auditory tasks, Engine noise, Harmonics, Waveforms.

For abstract, see STAR 1122

SLA-73-423/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
MODELING THE SOFAR CHANNEL IN THE OCEAN WITH A GAS WAVEGUIDE.
H. C. Hardee, and W. N. Sullivan. Jun 73, 32p

Descriptors: (*Seas, Sound waves), (*Sound waves, *Functional models), Explosions, Simulators, Wave propagation, Waveguides.

For abstract, see NSA 28 07, number 17804.

20B. Crystallography

AD-768 521/7GA Reprint
State Univ of New York Stony Brook Dept of Materials Science
REACTIONS OF SILICON WITH SURFACES OF CLOSE-PACKED METALS. III. SILICON ON BERYLLIUM,
F. Jona. 23 Apr 73, 4p AFOSR-TR-73-1941
Grant AF-AFOSR-2151-72
See also report dated 1 Aug 72, AD-758 119.
Availability: Pub. in Jnl. of Applied Physics, v44 n9 p4240-4241 Sep 73.

Descriptors: (*Semiconducting films, Vapor plating), (*Silicon, Epitaxial growth), Substrates, Beryllium, Surfaces, Diffusion, Electron diffraction analysis.
Identifiers: Chemical vapor deposition, Amorphous semiconductors, Low energy electron diffraction, Close packed lattices.

Deposition of silicon onto a clean Be(0001) surface results in an ordered superstructure which is characterized by the presence of (1/3)-order spots in the low energy electron diffraction pattern of the clean surface. This is the (sq root of 3)x(sq root of 3)-30 degrees structure that was predicted in an earlier report. Epitaxial growth of crystalline Si films is hindered, however, at low temperatures by the low mobility of the adsorbed atoms (the Si films are amorphous) and at high temperatures by the rapid diffusion of Si into the interior of the substrate. (Author)

AD-768 600/9GA Reprint
California Univ San Diego La Jolla Dept of Physics
THE EFFECT OF HIGH PRESSURE ON THE CRYSTAL STRUCTURE OF LAOS2 AND CEOS2,
John F. Cannon, H. Tracy Hall, Donald L. Robertson, and A. C. Lawson. 17 Oct 72, 5p
AFOSR-TR-73-1808
Contract F44620-72-C-0017
Availability: Pub. in the Jnl. of the Less-Common Metals, v31 p174-176 1973.

Descriptors: (*Lanthanum compounds, Crystal structure), (*Cerium alloys, Crystal structure), (*Osmium alloys, Crystal structure), High-pressure research, High-temperature research, Intermetallic compounds, Praseodymium, Lanthanum.
Identifiers: *Lanthanum intermetallics, *Cerium intermetallics, *Osmium intermetallics, *Praseodymium intermetallics, Lattice parameters.

Experiments conducted at 70 kbar and 1000C resulted in the conversion of the cubic starting materials (LaOs2, CeOs2 and PrOs2) to the hexagonal form. Further experiments revealed that hexagonal CeOs2 could be prepared at pressures as low as 6 kbar (the lowest pressure used in this work) and that the lowest synthesis pressure for hexagonal LaOs2 is between 6 and 14 kbar. It was also noted that at temperatures above 1050-1100C the cubic structure was retained regardless of the pressure. X-ray data are given.

AD-768 670/2GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
A VERTICAL THERMAL-IMAGING FURNACE FOR SINGLE CRYSTAL GROWTH.
Instrumentation papers,
William G. Field, and John L. Sampson. 2 Jul 73, 42p* Rept nos. AFCRL-TR-73-0386, AFCRL-IP-192

Descriptors: (*Crystal growth, Furnaces), (*Single crystals, Crystal growth), Design, Ruby, Spinels, Yttrium, Yttrium compounds, Aluminum compounds, Garnet, Rutile, Rare earths, Cobalt compounds, Press forging.
Identifiers: Czochralski method, Yttrium aluminum garnets, Laser materials.

The concepts of thermal-imaging as applied to the growth of single crystals are presented. A brief history of thermal-imaging is covered with special emphasis on the work done at AFCRL. The design and construction of a vertical furnace embodying these principles is covered together with its use for the growth of a number of single crystals. The furnace represents an advance in the techniques of growth of single crystals of many materials with Air Force applications, including laser hosts, substrate materials, and permanent magnet alloys. It makes possible the growth of these materials without contamination from crucibles and in optimum atmospheres. (Author)

AD-768 963/1GA PC$3.00/MF$1.45
Aerospace Corp El Segundo Calif
GROWTH TWINNING AND STACKING FAULTS IN CORUNDUM.
Rept. for Jul 61-Jan 63,
A. B. Chase, E. Stofel, and K. Janowski. 29 Oct 73, 30p Rept no. TR-0074(9230-01)-2 SAMSO-TR-73-303
Contract F04701-73-C-0074

Descriptors: (*Corundum, *Twinning(Crystallography)), Dislocations, Crystal lattice defects, Defects(Materials).

Several corundum crystals gorwn by the flux method were etched with hot KHSO4 and studied with an optical microscope. Examination showed a new form of line and pit pattern in addition to the more usual patterns formed by twin boundaries and dislocations. Several photographs and a simple model of atomic packing arrangement are presented to show that the new patterns probably are the result of stacking faults and partial dislocations. (Author)

AD-769 018/3GA Reprint
Naval Weapons Center China Lake Calif
THE GROWTH OF AU ON PBS, PBSE, PBTE, AND SNTE THIN FILM SUBSTRATES,
Technical publication,
A. K. Green, J. Dancy, and E. Bauer. 14 Mar 73, 12p Rept no. NWC-TP-5581
Availability: Pub. in Jnl. of Vacuum Science and Technology, v10 n4 p494-502 Jul/Aug 73.

Descriptors: (*Metal films, Epitaxial growth), Semiconducting films, Semiconductor devices, Manufacturing methods, Substrates, Gold, Lead compounds, Tin compounds, Sulfides, Selenides, Tellurides.
Identifiers: Lead sulfides, Lead selenides, Lead tellurides, Tin tellurides.

The formation of thin Au films by vacuum evaporation on lead and tin chalcogenides is investigated. Single crystal chalcogenide substrates are prepared by vacuum evaporation onto KC1. The films are studied by RHEED prior to removal from the KC1 substrate and by TEM and TED after removing the composite Au-Chalcogenide film from the KC1. A remarkable variety of orientations and particle shapes is observed. The saturation particle density varies over a very wide range as a function of substrate material and temperature. Results are discussed and compared with the growth of Au on alkali halides. (Author)

LBL-1834/GA PC$6.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
EXPERIMENTAL TECHNIQUES FOR GROWING UNIDIRECTIONALLY SOLIDIFIED ORIENTED EUTECTICS.
L. J. Salmon. Jun 73, 78p
Contract W-7405-eng-48

Descriptors: (*Eutectics, *Crystal growth), Crystals, Entropy, Melting, Metals, Microstructure, Semimetals, Stability.

For abstract, see NSA 28 08, number 20629.

RISO-279/GA PC$3.00/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
AUTOMATIC LOW-TEMPERATURE SYSTEM FOR NEUTRON FOUR-CIRCLE DIFFRACTOMETER.
M. Merisalo, M. H. Nielsen, and K. Henriksen.
Jan 73, 14p
U.S. Sales Only.

Descriptors: (*Neutron diffraction, *Crystals), Cooling, Gases, Low temperature, Nitrogen, Temperature control.

For abstract, see NSA 28 07, number 17796.

RT/FI-(73)7/GA PC$5.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
ACCURACY OF EXPERIMENTAL DATA AND SIGNIFICANCE OF THE RESULTS.
M. Agostinelli, and F. Pompa. 8 Feb 73, 74p
CONF-710987-1
In Italian. U.S. Sales Only.

Descriptors: (*X-ray diffraction, *Accuracy), Crystallography, Errors.

For abstract, see NSA 28 07, number 17800.

UJV-2948-M/GA PC$3.00/MF$1.45
Ceskoslovenska Akademie Ved, Rez. Ustav Jaderneho Vyzkumu.
TABLES FOR THE INTERPRETATION OF SPOT DIFFRACTION PATTERNS OF ALPHA - ZIRCONIUM.
J. Kocik. May 73, 16p
In Czech. U.S. Sales Only.

Descriptors: (*Zirconium-alpha, *Crystal lattices), Electron diffraction.

For abstract, see NSA 28 07, number 16012.

20C. Electricity and Magnetism

LA-tr-73-16/GA PC$3.00/MF$1.45
EFFECT OF TWIST ON AC LOSS.
Y. Furuto, C. Ikeda, S. I. Meguro, and I. Inoue. 2p
Translation of ac Rosu ni Okeru Tsuisto Koka.

Descriptors: (*Superconductors, *Alternating current), Eddy currents, Electrons, Geometry, Losses, Wires.

For abstract, see NSA 28 07, number 16811.

20D. Fluid Mechanics

AD-768 419/4GA PC$3.75/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
MIXED FLOW EQUATIONS,
Yu. G. Logachev. 1 Oct 73, 34p Rept no. FTD-HT-23-855-73
Edited trans. of Mekhanika Protessov Aviatsionnogo Opryskivaniya i Rasseivaniya Sypuchikh Veshchestv (USSR) v3 n219 p17-43 1971, by Paul J. Reiff.

Descriptors: (*Gas flow, *Two-phase flow), (*Particles, *Fluid dynamic properties), Air, Solids, Equations of motion, Time, USSR.
Identifiers: Translations.

The viewpoint of L. Euler is assumed for the motion of a mixed medium in a stationary space. Under these circumstances parameters in the general case are functions of coordinates and time. The mixed medium consists of an air medium and particles of matter.

AD-768 440/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
HYPERSONIC NONSTATIONARY FLOW OF A GAS FUEL MIXTURE AROUND BODIES OF VARYING SHAPES,
S. M. Gilinskii, and L. I. Zak. 1 Oct 73, 18p Rept no. FTD-HT-23-842-73
Edited trans. of Gorenie i Vzryv, Materialy Vsesoyuznogo Simpoziuma po Goreniyu i Vzryvu (3rd) n.p., 10 Jul 71. Papers, n.p., n.d., p374-381, by John A. Miller.

Descriptors: (*Leading edge, Hypersonic flow), Wedges, Blunt bodies, Shock waves, Vibration, Thermodynamics, USSR.
Identifiers: Translations.

When bodies are fired at high speeds into hydrogen-air and hydrogen-oxygen mixtures we observe several characteristic flow regimes: stationary --with smooth shock and thermal fronts; non-structure of the burning region in the form of circular waves; regimes with complex structure, with formation of internal discontinuties that interact with the forward shock and distort it. Stationary regimes have been studied previously, and the basic results have been described. The report gives an explanation for the occurrence of pulsational burning regimes originating during hypersonic flow past a wedge and the leading edge of blunt bodies.

AD-768 541/5GA Reprint
California Univ San Diego La Jolla
VELOCITY PROFILES IN STEADY AND UNSTEADY ROTATING FLOWS FOR A FINITE CYLINDRICAL GEOMETRY. II,
T. Jerskey, and S. S. Penner. 28 Aug 72, 7p
AFOSR-TR-73-1928
Contract F44620-68-C-0010
See also report dated 27 Oct 69, AD-718 511.
Availability: Pub. in The Physics of Fluids, v16 n6 p769-774 Jun 73.

Descriptors: (*Water, Rotation), (*Velocity, Fluid flow), Cylindrical bodies, Azimuth, Disks, Oscillation, Boundary layer.
Identifiers: Rotating disks, Unsteady flow, Steady flow, Laser Doppler techniques.

Measurements have been performed with a laser-Doppler velocimeter of the radial dependence of azimuthal velocity components, using water, in cylindrical containers with aspect ratios ranging from 0.212 to 1.64. The reciprocal Ekman number ranged from 980 to 60000. The radius was fixed at 5.25 cm. The rotating disk was located at the top. The data are in fair agreement with numerical results of Tomlan and Hudson. Spindown parameters fit a theoretical solution given previously. Observed oscillations during spin-down have been accounted for through a heuristic argument involving convection of boundary-layer fluid downward along the axis near the just-stopped disk. (Modified author abstract)

AD-768 612/4GA PC$2.75/MF$1.45
Sydney Univ (Australia) Dept of Aeronautical Engineering
NUMERICAL STUDIES IN GAS DYNAMICS.
Interim rept. 15 Apr 72-14 Apr 73,
Graeme A. Bird. 15 Apr 73, 6p AFOSR-TR-73-1949
Grant AF-AFOSR-2336-72

Descriptors: (*Gas flow, *Superaerodynamics), (*Fluid dynamic properties, Numerical analysis), Vacuum, One-dimensional flow, Thermal properties, Monte Carlo method, Reflection, Molecular properties, Australia.
Identifiers: Expanding flow, Gas impact.

A study was made of the flow which results when an initially uniform gas expands into a vacuum through a complete one-dimensional rarefaction wave and then strikes a solid wall or similar opposite facing rarefaction. Calculation of the asymptotic temperature at the wall or line of symmetry involves a molecular analysis of the initial stages of reflection. A direct simulation Monte Carlo method was supported by continuum calculations and experiment. A combined numerical analytical and experimental study was also carried out for the thermal forces on very small particles suspended in the atmosphere. (Modified author abstract)

AD-768 613/2GA PC$4.00/MF$1.45
California Univ Riverside Dept of Mathematics
GENERALIZED AND CLASSICAL SOLUTIONS OF THE NONLINEAR STATIONARY NAVIER-STOKES EQUATIONS,
Victor L. Shapiro. 1973, 40p AFOSR-TR-73-1921
Grant AF-AFOSR-2456-73

Descriptors: (*Fluid flow, *Navier-Stokes equations), Transcendental functions, Special functions(Mathematical), Fourier analysis, Integration, Numerical analysis, Theorems.
Identifiers: Numerical integration, Periodic functions, Spherical harmonics.

New regularity results in domains of Euclidean 3-space are established for the generalized solutions of the nonlinear stationary Navier-Stokes equations in terms of Dini criteria on the external force. (Author)

AD-768 657/9GA Reprint
Brown Univ Providence R I Div of Applied Mathematics
EVOLUTION OF FINITE DISTURBANCES IN DISSIPATIVE GASDYNAMICS,
Lorne Halabisky, and Lawrence Sirovich. 5 Jun 72, 9p
Contract Nonr-562(39)
Revision of report dated 28 Dec 71.
Availability: Pub. in the Physics of Fluids, v16 n3 p360-368 Mar 73.

Descriptors: (*Gas flow, *Navier-Stokes equations), Compressible flow, Initial value problems, Shock tubes, Integration, Numerical analysis.
Identifiers: *Gas dynamics.

The initial-value problem for small amplitude disturbances governed by the Navier-Stokes equations is considered. This is shown to be governed by a system of Burgers and diffusion equations. The asymptotic solution of the finite amplitude initial-value problem is obtained by the introduction of asymptotic initial data. The analysis is also applied to the solution of a semi-infinite shock tube problem. (Author)

AD-768 658/7GA Reprint
Brown Univ Providence R I Div of Applied Mathematics
KINETIC THEORY OF SUCTION FLOW,
Anthony Ganz, and Lawrence Sirovich. 25 Feb 72, 9p
Contract Nonr-562(39)
Revision of report dated 5 Apr 71.
Availability: Pub in the Physics of Fluids, v16 n1 p50-58 Jan 73.

Descriptors: (*Incompressible flow, Kinetic theory), Navier-Stokes equations, Hydrodynamics, Integration, Numerical analysis.

An exact solution is obtained for the suction flow problem. Hydrodynamical theory is shown to be valid only under a certain limit. The neighborhood of the boundary and the neighborhood of infinity are shown to always be kinetic layers. The exact solution is then used for a general determination of slip coefficients to be used as perturbation boundary conditions in the Chapman-Enskog-Hilbert method. One explicit result of this, is the resolution of the problem of slip velocity in a pressure gradient field. (Author)

AD-768 660/3GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
FLOWS OF THIN STREAMS WITH FREE BOUNDARIES,
Joseph B. Keller, and James Geer. 26 Jan 73, 18p Rept no. NYU-ONR-H47
Contract N00014-67-A-0467-0006, Grant NSF-GP-32996
Prepared in cooperation with State Univ. of New York, Binghamton. School of Advanced Technology.
Availability: Pub. in Jnl. of Fluid Mechanics, v59 pt3 p417-432 1973.

Descriptors: (*Two-dimensional flow, Potential theory), Gravity, Complex variables, Analytic functions.
Identifiers: Channel flow.

A method is developed for determining any thin steady two-dimensional potential flow with free and/or rigid boundaries in the presence of gravity. The flow is divided into a number of parts and in each part the flow and its free boundaries are represented as asymptotic series in powers of the slenderness ratio of the stream. There are three basic flows, having two, one and no free boundaries and called jet flow, wall flow and channel flow, respectively. (Modified author abstract)

AD-768 679/3GA Reprint
Brown Univ Providence R I
NONLINEAR EFFECTS IN STEADY SUPERSONIC DISSIPATIVE GASDYNAMICS. PART 2. THREE-DIMENSIONAL AXISYMMETRIC FLOW,
T. H. Chong, and L. Sirovich. 10 Aug 72, 11p
Contract Nonr-562(39)
Revision of report dated 30 Nov 70. See also report dated 16 Mar 71, AD-736 716.
Availability: Pub. in Jnl. of Fluid Mechanics, v58 pt1 p53-63 1973.

Descriptors: (*Three-dimensional flow, *Supersonic characteristics), (*Slender bodies, *Axially symmetric flow), Wave transmission, Gas flow, Nonlinear systems, Dissipation factor, Equations of motion, Wake.
Identifiers: Inviscid flow.

Steady, supersonic, dissipative, three-dimensional, axisymmetric flow is considered. A system of Burgers-type equations is shown to govern the flow field. In inviscid regions the Whitham theory gives the limiting form. Dissipative effects ultimately engulf the inviscid zone and at sufficiently large distances from the body the flow is governed by linear dissipative theory. The flow field is divided into zones based on the presence or absence of nonlinearity and dissipation. Estimates and criteria which describe the extent of these zones are given.

AD-768 841/9GA PC$3.50/MF$1.45
Polytechnic Inst of Brooklyn Farmingdale N Y Dept of Aerospace Engineering and Applied Mechanics
EXPERIMENTS IN MULTI-DIMENSIONAL FLOATING SHOCK-FITTING,
Gino Moretti. Aug 73, 52p Rept no. PIBAL-73-18
Contract N00014-67-A-0438-0009

Descriptors: (*Supersonic flow, Shock waves), Three-dimensional flow, Compressible flow, Flow fields, Graphics, Curve fitting, Numerical analysis.

Four numerical experiments are performed to support floating shock-fitting techniques in multi-dimensional flow problems. By floating shock-fitting is meant the fitting of a shock as a sharp discontinuity, free of moving within the computational mesh. Evidences of accuracy and stability are given. (Author)

AD-768 881/5GA PC$4.75/MF$1.45
Lehigh Univ Bethlehem Pa Dept of Mechanical Engineering and Mechanics
LAMINAR FLOW IN A TWO-DIMENSIONAL CHANNEL WITH A RIGHT ANGLE CORNER.
Technical rept.,
R. M. Wilson, and J. A. Owczarek. Aug 73, 154p
Rept no. THEMIS-LU-TR-19
Contract N00014-69-A-0417

Descriptors: (*Laminar flow, Geometric forms), Flow fields, Numerical methods and procedures, Flow visualization, Flow separation, Reynolds number, Two-dimensional flow, Equations of motion, Navier-Stokes equations, Stability, Velocity.
Identifiers: *Corner flow, Channel flow, Themis project, Finite difference.

Laminar, steady, incompressible flow in a two-dimensional channel with a right angle corner was investigated by numerical analysis and experimental measurement. The problem was used as a vehicle to compare a finite differencing method with an upwind differencing scheme. From the numerical solutions, zones of separated flow in the outside (reentrant) corner were found at all Reynolds numbers investigated. A second separation region, extending downstream from the inside (salient) corner was found. Several different methods of formulating the vorticity at the salient corner were investigated. Experimentally measured velocity profiles and smoke photographs of the separation regions indicated reasonable agreement with calculated solutions. (Modified author abstract)

AD-768 882/3GA PC$5.50/MF$1.45
Lehigh Univ Bethlehem Pa Dept of Mechanical Engineering and Mechanics
WALL JET RECEIVER FLOW FIELD.
Technical rept.,
H. S. Shen, and D. O. Rockwell. Aug 73, 216p Rept no. THEMIS-LU-TR-18
Contract N00014-69-A-0417

Descriptors: (*Jet mixing flow, Statistical analysis), (*Fluid amplifiers, Hydrodynamics), Flow fields, Hydrodynamic configurations, Mathematical models, Model tests, Pressure, Vortices, Flow visualization.
Identifiers: Fluidic receivers, Wall jets, Pressure distribution, Themis project.

The wall jet-receiver flow field was studied analytically and experimentally for two values of jet nozzle exit Reynolds number (5000 and 14,000). Various distances of receiver entrance from jet nozzle exit, receiver throughflow conditions, and dimensionless receiver widths were considered. Four different flow regimes were identified, and corresponding regime maps were constructed. Potential flow, frozen vorticity, and control volume techniques were used to predict the receiver influence length, receiver pressure recovery, receiver entrance spill flow angle, and velocity profiles inside the receiver. (Author)

AD-768 902/9GA PC$3.50/MF$1.45
Lehigh Univ Bethlehem Pa Center for the Application of Mathematics
CONDENSATION SHOCKS.
Technical rept.,
C. J. Shih, and P. A. Blythe. Aug 73, 53p Rept no. CAM-100-29 BRL-CR-115
Contract DAAD05-69-C-0053

Descriptors: (*Nozzle gas flow, Supersonic flow), (*Supersonic flow, Shock waves), Condensation, Drops, Partial differential equations, Integration.
Identifiers: *Gas dynamics.

Supersonic nozzle flows of a condensible vapor are considered in the high activation limit for homogeneous nucleation. Conditions under which the final collapse of the supersaturated state is described by a condensation shock are determined. The analysis leads to a natural definition for the shock position. It is shown that the shock zone is associated with droplet growth. Droplet production occurs upstream of this region. Some useful similarity laws are obtained for the production zone. (Author)

AD-768 905/2GA PC$4.50/MF$1.45
California Univ Berkeley Coll of Engineering
A SINGULARITY-DISTRIBUTION METHOD FOR FREE-SURFACE FLOW PROBLEMS WITH AN OSCILLATING BODY,
Ronald Wai-Chun Yeung. Aug 73, 132p Rept no. NA-73-6
Contract N00014-69-A-0200-1023

Descriptors: (*Hydrodynamics, Boundary value problems), (*Oscillation, Boundary value problems), (*Ship hulls, Hydrodynamics), Two-dimensional flow, Three-dimensional flow, Harmonic analyzers, Potential theory, Green's function, Damping, Pitch(Motion), Yaw, Programming(Computers), Curve fitting, Graphics.
Identifiers: Degrees of freedom, Forced oscillations.

Boundary value problems associated with the forced oscillation of a body of general shape in the free surface of an inviscid fluid are considered. The originally external boundary value problems are first converted to internal ones by applying the radiation condition at a finite distance from the source of disturbances. Next, application of Green's theorem, using the source function for an unbounded fluid, reduces the problem to the solution of an integral equation with the unknown function being the velocity potential along the entire boundary of the fluid. No restrictions on the body shape nor the bottom geometry are necessary. A modified method to deal with the case of an infinitely deep fluid is also presented. (Modified author abstract)

AD-768 917/7GA PC$2.75/MF$1.45
Mississippi State Univ State College
NUMERICAL SOLUTION OF THE THREE-DIMENSIONAL NAVIER-STOKES EQUATIONS IN INTEGRO-DIFFERENTIAL FORM: FLOW ABOUT A FINITE BODY,
J. F. Thompson, Jr., S. P. Shanks, and J. C. Wu.
1973, 13p AROD-T-3.17-E
Contract DAHC04-68-C-0003
Prepared in cooperation with Georgia Inst. of Technology, Atlanta. Also pub. in Proceedings of AIAA Computational Fluid Dynamics Conference, Palm Springs, Calif. 19-20 Jul 73.

Descriptors: (*Incompressible flow, *Navier-Stokes equations), Vortices, Flow fields, Integration, Numerical analysis, Integral equations, Three-dimensional flow.

A new method of numerical solution of the incompressible Navier-Stokes equations is applied to time-dependent flow about a rectangular slab at an angle of attack. With this formulation the solition is obtained in the entire unbounded flow field, but with actual computation required only in regions of significant vorticity. This allows considerable reduction in computer storage, since only points in regions of signficant vorticity need be stored at any particular time. The computational field thus expands in time. (Modified author abstract)

AD-768 966/4GA PC$4.25/MF$1.45
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Aerospace Engineering
INVISCID SUPERSONIC NONUNIFORM FLOWS OVER SHARP AND SPHERICALLY BLUNTED CONES AT ANGLE OF ATTACK. VOLUME I. ENGINEERING REPORT.
Final rept. 1 Sep 69-1 Dec 72,
Roie R. Black, and Clark H. Lewis. Aug 73, 115p
ARL-73-0124-Vol-1
Contract F33615-70-C-1015

Descriptors: (*Conical bodies, *Supersonic characteristics), (*Programming(Computers), Three-dimensional flow), Blunt bodies, Wake, Axially symmetric flow, Viscosity, Flow fields, Problem solving, Two-dimensional flow, Shear stresses, Subsonic characteristics, Nose cones.
Identifiers: Inviscid flow, Unsteady flow, Sharp bodies, Viscous flow, Shear flow.

A system of computer programs was developed to solve supersonic inviscid nonuniform flows over sharp and spherically blunted cones at angles of attack. For blunt cones the flow fields considered were axisymmetric wake flows situated so that flow in the subsonic nose region remained axisymmetric. For sharp cones both axisymmetric wake flows and two-dimensional shear flows were considered. The programs incorporate a modified inverse method for solving subsonic flow regions and modified axisymmetric and three-dimensional method of characteristics procedures for solving supersonic flow regions. (Modified author abstract)

AD-769 005/0GA PC$3.00/MF$1.45
Michigan Univ Ann Arbor Dept of Naval Architecture and Marine Engineering
FLUTTER-LIKE OSCILLATIONS OF A PLANING PLATE.
Final rept.,
T. Francis Ogilvie, and Young-Tsun Shen. Jul 73, 34p Rept no. 146
Contract N00014-67-A-0181-0019

Descriptors: (*Planing surfaces, Oscillation), (*Hydrodynamics, Flutter), Lift, Stability, Water, Flat plate models, Mathematical models, Linear systems, Hydrofoils, Angle of attack, Loading(Mechanics), Experimental data.
Identifiers: Lifting surface theory, Flow instability, Heaving.

By means of a linear analysis, it is shown that the steady motion of a planing plate in two dimensions is always unstable in heave; the vertical motion of the water ahead of the plate causes the plate to have an effective chord length which oscillates along with any heave oscillation, and the damping coefficient of such an oscillation is negative if the reduced frequency is less than a computed critical value. This result suggests that 2-D planing is always unstable. However, when the planing plate supports a given load and has a given angle of attack, the flow will be more like that of a supercavitating hydrofoil at low speeds, and only at high speed will the characteristic planing flow be established. (Modified author abstract)

AD-769 013/4GA Not available NTIS
Mcgill Univ Montreal (Quebec) Dept of Mechanical Engineering
TURBULENT JETS AND WALL JETS IN UNIFORM STREAMING FLOW,
Rajni P. Patel. Mar 70, 18p
Availability: Pub. in the Aeronautical Quarterly, v22 p311-326 Nov 71.

Descriptors: (*Jets, *Fluid dynamic properties), Canada, Mathematical models, Turbulence, Walls, Orifices, Equations of motion, Experimental data, Velocity, Pressure.
Identifiers: Eddy viscosity, Constant pressure.

For plane turbulent jets and wall jets in uniform streaming flow a simple method, based on a simple empirical formula for the rate of growth which differs from that proposed by Abramovich, is presented. The predictions of length scale and velocity scale are in good agreement with experimental results for all ratios of free-stream to jet exit velocity and the eddy viscosity Reynolds number has the correct asymptotic values.

AD-769 033/2GA Not available NTIS
Waterloo Univ (Ontario) Dept of Mechanical Engineering
MEASURED AND PREDICTED FLOW NEAR THE EXIT OF A RADIAL-FLOW IMPELLER,
G. B. McDonald, E. Lennemann, and J. H. G. Howard. 21 Dec 70, 7p
Presented at the Gas Turbine Conference and Products Show, Houston, Tex., 28 Mar-1 Apr 71, of the American Society of Mechanical Engineers. (Paper 71-GT-15).
Availability: Pub. in Transactions of the ASME: Jnl. of Engineering for Power, p441-446 Oct 71.

Descriptors: (*Gas turbines, *Flow fields), (*Impellers, *Fluid dynamic properties), Canada, Turbine blades, Aerodynamic configurations, Velocity, Shrouded propellers, Mathematical prediction, Model tests, Equations of motion.
Identifiers: Velocity fields, Centrifugal impellers, Backward swept blades, Hot film anemometry, Inviscid flow.

Experimental measurements are presented of the velocity field near the exit of a radial impeller with backward-curved blades. The flow pattern and its variation with changes in the flow coefficient are compared with numerical predictions on a blade-to-blade plane. The theoretical flow prediction method assumes inviscid flow, is essentially two-dimensional and is based on the streamline curvature approach.

AD-769 093/6GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
ON THE GROWTH AND COLLAPSE OF MIXED REGIONS IN STRATIFIED FLUIDS.
Final rept.,
K. G. Williams. 25 Sep 73, 40p Rept no. NRL-7586

Descriptors: (*Hydrodynamics, Diffusion), (*Wake, Dispersion relations), Wave transmission, Model tests, Test facilities, Test methods, Fluid dynamic properties, Flow visualization, Thermal properties.
Identifiers: *Wake collapse, *Mixed regions, Stratified fluids, Wave fields.

Experimental observations were made of the development of a mechanically generated, mixed region in the interior of a density-stratified fluid. The results showed that internal waves were initiated in the exterior unmixed fluid before the mixed region reached its maximum vertical extent and began to collapse. (Author)

CEA-CONF-2311/GA PC$3.25/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
MODELING METHODS IN TWO PHASE FLOW THERMOHYDRAULICS.
J. A. Boure. 1972, 21p CONF-720686-1
U.S. Sales Only.

Descriptors: (*Two-phase flow, *Flow models), Scaling laws.

For abstract, see NSA 28 07, number 15433.

CEA-N-1639/GA PC$3.75/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
CRITICAL FLOW RATES.
M. Reocreux. 2 May 73, 34p
In French. U.S. Sales Only.

Descriptors: (*Two-phase flow, *Critical flow), Air, Flow models, Heat transfer, Mass transfer, Water, Water vapor.

For abstract, see NSA 28 07, number 17726.

CEA-N-1641/GA PC$5.00/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
PRESSURE DROP AND INSTABILITIES IN TWO-PHASE GAS--LIQUID FLOWS.
S. Fabrega. Feb 73, 59p
In French. U.S. Sales Only.

Descriptors: (*Two-phase flow, *Instability), Boiling, Flow models, Liquids, Pressure gradients, Vapors, Void fraction.

For abstract, see NSA 28 07, number 17727.

CEA-N-1642/GA PC$5.75/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
HEAT TRANSFER IN TWO-PHASE LIQUID--GAS FLOWS.
R. Semeria. Feb 73, 75p
In French. U.S. Sales Only.

Descriptors: (*Two-phase flow, *Heat transfer), (*Boiling, Heat transfer), Burnout, Dryout, Heating, Liquids, Mass transfer, Reviews, Vapor condensation, Vapors.

For abstract, see NSA 28 07, number 17728.

CEA-R-4442/GA PC$8.25/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
TURBULENT CONDUCTIVITY IN A FLOW BETWEEN TWO PLANE PARALLEL WALLS IN A REGIME ESTABLISHED WITH A TRANSVERSE VELOCITY GRADIENT.
J. M. Auxilien. Jun 73, 124p
In French. U.S. Sales Only.

Descriptors: (*Fluid flow, *Heat transfer), (*Heat exchangers, *Fins), Anisotropy, Convection, Reynolds number, Thermal conductivity, Turbulence, Velocity.

For abstract, see NSA 28 07, number 17733.

COO-1248-35/GA PC$3.50/MF$1.45
Minnesota Univ., Minneapolis. Particle Technology Lab.
FLUID MECHANICS OF THE LAMINAR FLOW AEROSOL IMPACTOR.
V. A. Marple, B. Y. H. Liu, and K. T. Whitby. Mar 73, 30p CONF-730607-2

Descriptors: (*Aerosols, *Sampling), (*Air samplers, *Fluid mechanics), Laminar flow, Particle size, Particles.

For abstract, see NSA 28 07, number 15426.

N73-29998/4GA PC$8.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany). Inst. fuer Luftstrahlantriebe.
CALCULATION OF PLANE SUPERSONIC CASCADE FLOW USING THE ANALYTICAL CHARACTERISTICS METHOD BERECHNUNG DER EBENEN UEBERSCHALLGITTERSTROEMUNG MIT HILFE DES ANALYTISCHEN CHARAKTERISTIKENVERFAHRENS.
Ph.D. Thesis - Aachen Univ.
H. Lichtfuss. 16 Feb 73, 116p DLR-FB-73-34
In German; English Summary.

Descriptors: *Cascade flow, *Flow characteristics, *Method of characteristics, *Supersonic flow, Flow theory, Ideal gas, Isoenergetic processes, Oblique shock waves, Prandtl-meyer expansion, Two dimensional flow.

For abstract, see STAR 1121

N73-30000/6GA PC$3.25/MF$1.45
National Aerospace Lab., Amsterdam (Netherlands).
A METHOD FOR THE CALCULATION OF THE FLOW FIELD INDUCED BY A FREE JET.
H. Snel. Apr 72, 25p NLR-TR-72040-U
Subm-Sponsored by Neth. Agency for Aerospace Programs (Nivr).

Descriptors: *Flow distribution, *Jet flow, *Neumann problem, *Pressure distribution, *Singularity (Mathematics), Flat plates, Free jets, Jet lift, Stagnation flow.

For abstract, see STAR 1121

N73-30229/1GA PC$4.50/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
FLOW VISUALISATION USING THE HYDROGEN BUBBLE TECHNIQUE.
D. H. Thompson. Feb 73, 50p ARL/A-NOTE-338

Descriptors: *Aerodynamics, *Flow visualization, *Hydraulic test tunnels, *Water flow, Electric current, Electrodes, Electrolysis, Hydrodynamics, Hydrogen, Oxygen, Water temperature.

For abstract, see STAR 1121

N73-30232/5GA PC$8.75/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A STUDY OF THE EFFECT OF A BOUNDARY LAYER PROFILE ON THE DYNAMIC RESPONSE AND ACOUSTIC RADIATION OF FLAT PANELS.
Ph.D. Thesis - Virginia Univ.
J. S. Mixson. Jun 73, 132p NASA-TM-X-69568

Descriptors: *Blasius flow, *Boundary layer flow, *Dynamic structural analysis, *Flat plates, Aerodynamic characteristics, Aerodynamic coefficients, Flow equations, Numerical analysis.

For abstract, see STAR 1121

N73-30233/3GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AN INVESTIGATION OF A FREE JET AT LOW REYNOLDS NUMBERS.
M.S. Thesis - Old Dominion Univ.
G. C. Greene. Aug 73, 42p NASA-TM-X-69566

Descriptors: *Flow characteristics, *Jet flow, *Nozzle design, *Nozzle flow, Flow equations, Incompressible flow, Reynolds number.

For abstract, see STAR 1121

N73-30236/6GA PC$3.00/MF$1.45
National Aerospace Lab., Tokyo (Japan).
A DESCRIPTION OF THE IDEAS UNDERLYING A COMPUTER PROGRAM FOR PREDICTING THE AEROFOIL PRESSURE DISTRIBUTIONS IN SUB-CRITICAL VISCOUS FLOW.
M. Ebihara, Y. Ishida, and T. Okonogi. 1971, 18p NAL-TR-248
In Japanese; English Summary.

Descriptors: *Air flow, *Airfoils, *Flow characteristics, *Pressure gradients, *Viscous flow, Computer programs, Data processing equipment, Numerical analysis.

For abstract, see STAR 1121

N73-30237/4GA PC$3.00/MF$1.45
Specola Vaticana (Vatican City).
NOTE ON VARIATIONAL PRINCIPLES GOVERNING SMALL DEPARTURES FROM EQUILIBRIUM IN GASEOUS SPHERES AND IN HORIZONTAL FLUIDS.
P. Smeyers. 1973, 9p

Descriptors: *Adiabatic conditions, *Fluids, *Gases, *Variational principles, Equations of motion, Stratified flow.

For abstract, see STAR 1121

N73-30240/8GA PC$13.00/MF$1.45
Pennsylvania State Univ., University Park. Dept. of Aerospace Engineering.
INVESTIGATION OF BOUNDARY LAYER AND TURBULENCE CHARACTERISTICS INSIDE THE PASSAGES OF AN AXIAL FLOW INDUCER.
A. Anand, C. Gorton, B. Lakshminarayana, and H. Yamaoka. Jul 73, 220p NASA-CR-121248, PSU-AERSP-73-9
Contract NGL-39-009-007

Descriptors: *Boundary layer flow, *Flow characteristics, *Three dimensional flow, *Turbomachinery, Axial flow, Flow equations, Prediction analysis techniques, Turbulent flow.

For abstract, see STAR 1121

N73-30242/4GA PC$9.00/MF$1.45
Texas Univ., Austin. Dept. of Aerospace Engineering and Engineering Mechanics.
ANALYSIS OF A TWO-DIMENSIONAL TYPE 6 SHOCK-INTERFERENCE PATTERN USING A PERFECT-GAS CODE AND A REAL-GAS CODE.
J. J. Bertin, and B. W. Graumann. Aug 73, 138p NASA-CR-134010, REPT-73003
Contract NAS9-10976

Descriptors: *Flow characteristics, *Supersonic flow, *Two dimensional flow, *Wedge flow, Flow equations, Heat transfer, Hypersonic flow, Numerical analysis, Pressure distribution.

For abstract, see STAR 1121

N73-30243/2GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
LOADING AND HEATING OF A LARGE FLAT PLATE AT MACH 7 IN THE LANGLEY 8-FOOT HIGH-TEMPERATURE STRUCTURES TUNNEL.
W. D. Deveikis, and L. R. Hunt. Sep 73, 67p NASA-TN-D-7275, L-8760

Descriptors: *Aerothermodynamics, *Air flow, *Boundary layer transition, *Flat plates, *Hypersonic flow, *Hypervelocity wind tunnels, Flow distribution, Pressure gradients, Temperature distribution, Turbulent flow.

For abstract, see STAR 1121

N73-30245/7GA PC$5.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Lampoldshausen (West Germany). Inst. fuer Chemische Raketenantriebe.
FLOW-RATE MEASUREMENTS WITH CAVITATING VENTURI TUBES.
J. Broschk. 5 May 72, 56p DLR-FB-72-33
In German; English Summary.

Descriptors: *Cavitation flow, *Flow measurement, *Flow velocity, *Venturi tubes, Flowmeters, Influence coefficient, Liquid rocket propellants, Mass flow rate, Pressure measurements.

For abstract, see STAR 1121

N73-30246/5GA PC$5.50/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Aachen (West Germany). Inst. fuer Theoretische Gasdynamik.
PROPAGATION OF PLANE PRESSURE WAVES THROUGH A MOVABLE WALL DIE FORTPFLANZUNG EBENER DRUCKWELLEN DURCH EINE BEWEGLICHE WAND.
Ph.D. Thesis - Aachen Univ.
H. Schwarze. 23 Aug 72, 67p DLR-FB-72-59
In German; English Summary.

Descriptors: *Elastic waves, *Flow distribution, *Plane waves, *Shock wave propagation, Buildings, Displacement, Wave reflection.

For abstract, see STAR 1121

N73-30247/3GA PC$7.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany). Inst. fuer Luftstrahlantriebe.
A METHOD OF CHARACTERISTICS FOR THREE-DIMENSIONAL, STEADY SUPERSONIC FLOW IN ROTATING AND STATIONARY ANNULAR CASCADES EIN CHARAKTERISTIKENVERFAHREN FUER DIE DREIDIMENSIONALE, STATIONAERE UEBERSCHALLSTROEMUNG IN ROTIERENDEN UND FESTSTEHENDEN RINGGITTERN.
Ph.D. Thesis - Aachen Univ.
H. H. Fruehauf. 1973, 97p DLR-FB-73-12
In German; English Summary.

Descriptors: *Annuli, *Method of characteristics, *Rotating bodies, *Three dimensional flow, Cascade flow, Flow equations, Numerical stability, Steady flow, Supersonic flow, Supersonic turbines.

For abstract, see STAR 1121

N73-30248/1GA PC$7.50/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany). Inst. fuer Dynamik Verduennter Gase.
DRAG MEASUREMENTS ON PLATES IN PARALLEL FLOW AND DISCS IN PERPENDICULAR FLOW IN SUPERSONIC HIGHLY RAREFIED FREE JETS.
Ph.D. Thesis - Goettingen Univ., West Ger.
H. Legge. 1973, 107p DLR-FB-73-17, AVA-FB-7225
In German; English Summary.

Descriptors: *Drag measurement, *Free jets, *Free molecular flow, *Low density flow, Aerodynamic coefficients, Flat plates, Flow distribution, Hypersonic wind tunnels, Rarefied gas dynamics.

For abstract, see STAR 1121

N73-30427/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MEASUREMENT CAPABILITIES OF A ONE-DIMENSIONAL LDV SYSTEM.
W. C. Cliff, and C. E. Fuller, Iii. Aug 73, 20p NASA-TM-X-64774

Descriptors: *Doppler effect, *Lasers, *Turbulent flow, *Velocity measurement, Laser range finders, Simultaneous equations, Three dimensional flow.

For abstract, see STAR 1121

N73-30677/1GA PC$3.75/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany). Abteilung Stroemungen Geringer Dichte und Hoher Enthalpie.
DENSITY AND TEMPERATURE MEASUREMENTS IN NONRADIATING GASES BY ANALYSIS OF SCATTERED LIGHT MOEGLICHKEITEN DER STREULICHTANALYSE ZUR DICHTE- UND TEMPERATURMESSUNG IN NICHTSTRAHLENDEN GASEN.
G. Schweiger, and M. Fiebig. Jul 72, 35p BMBW-FB-W-72-20
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
In German; English Summary.

Descriptors: *Flow measurement, *Gas analysis, *Gas density, *Light scattering, Ablation, Gas mixtures, Gas temperature, Laser outputs, Light scattering meters, Wind tunnels.

For abstract, see STAR 1121

N73-31236/5GA PC$4.75/MF$1.45
Tokyo Univ. (Japan). Inst. of Space and Aeronautical Science.
A STUDY OF SUPERSONIC CONICAL FLOW.
M. Kurosaki. Jul 73, 52p ISAD-4980-VOL-38-NO-9

Descriptors: *Conical flow, *Flow equations, *Supersonic flow, Approximation, Asymptotic methods, Bernoulli theorem, Independent variables, Stream functions (Fluids), Vortices.

For abstract, see STAR 1122

N73-31240/7GA PC$14.50/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NUMERICAL STUDIES OF UNSTEADY TWO DIMENSIONAL SUBSONIC FLOWS USING THE ICE METHOD.
Ph.D. Thesis - Toledo Univ.
P. R. Wieber. Aug 73, 246p NASA-TM-X-68288

Descriptors: *Computer programs, *Two dimensional flow, Algorithms, Chemical reactions, Compressible flow, Laminar flow.

For abstract, see STAR 1122

N73-31241/5GA PC$7.75/MF$1.45
Iowa State Univ. of Science and Technology, Ames. Dept. of Mechanical Engineering.
PREDICTION AND MEASUREMENT OF HEAT TRANSFER RATES FOR THE SHOCK-INDUCED UNSTEADY LAMINAR BOUNDARY LAYER ON A FLAT PLATE.
W. J. Cook. Oct 72, 112p NASA-CR-114582
Subm-Sponsored by NASA.

Descriptors: *Flat plates, *Heat transfer, *Laminar boundary layer, *Shock waves, Heat flux, Mathematical models, Measuring instruments, Time dependence, Unsteady flow.

For abstract, see STAR 1122

N73-31244/9GA PC$3.25/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Munich (West Germany).
FLOW CONDITIONS AT INLET AND EXIT OF A FLAT PLATE CASCADE AT SUPERSONIC VELOCITIES.
H. J. Lichtfuss, and H. Starken. 1972, 22p
Conf-Presented at the 1ST Intern. Symp. On Air Breathing Engines, Marseille, 19-23 June 1972.

Descriptors: *Cascade flow, *Flat plates, *Supersonic flow, *Two dimensional flow, Axial flow, Flow characteristics, Inlet flow.

For abstract, see STAR 1122

N73-31245/6GA PC$9.00/MF$1.45
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Aerospace Engineering.
VORTEX AGE AS A WAKE TURBULENCE SCALING PARAMETER.
J. R. Marshall, and J. F. Marchman, Iii. Aug 73, 138p NASA-CR-132312, VPI-AERO-006
Contract NAS1-10646

Descriptors: *Scaling laws, *Turbulent wakes, *Vortices, Angle of attack, Scale models, Wind tunnel tests.

For abstract, see STAR 1122

N73-31247/2GA PC$4.00/MF$1.45
Rocketdyne, Canoga Park, Calif.
DROPLET BREAKUP IN ACCELERATING GAS FLOWS. PART 1: PRIMARY ATOMIZATION.
L. J. Zajac. Oct 73, 40p NASA-CR-134478, R-9337-1-PT-1
Contract NAS3-14371

Descriptors: *Atomizing, *Drops (Liquids), *Jet impingement, *Jet mixing flow, *Spray characteristics, Drop size, Flow characteristics, Flow distribution, Gas flow.

For abstract, see STAR 1122

N73-31248/0GA PC$5.25/MF$1.45
Rocketdyne, Canoga Park, Calif.
DROPLET BREAKUP IN ACCELERATING GAS FLOWS. PART 2: SECONDARY ATOMIZATION.
L. J. Zajac. Oct 73, 61p NASA-CR-134479, R-9337-2-PT-2
Contract NAS3-14371

Descriptors: *Atomizing, *Drops (Liquids), *Jet impingement, *Jet mixing flow, *Spray characteristics, Drop size, Flow characteristics, Flow distribution, Gas flow.

For abstract, see STAR 1122

N73-31249/8GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
FREE-STREAM TEMPERATURE, DENSITY, AND PRESSURE MEASUREMENTS IN AN EXPANSION TUBE FLOW.
K. V. Haggard. Oct 73, 52p NASA-TN-D-7273, L-8788

Descriptors: *Gas density, *Gas expansion, *Molecular gases, *Oxygen, *Test facilities, Molecular relaxation, Temperature measurement, Wall pressure.

For abstract, see STAR 1122

N73-31252/2GA PC$5.75/MF$1.45
Kentucky Univ., Lexington. Dept. of Mechanical Engineering.
VISCOUS HYDRODYNAMIC INSTABILITY THEORY OF THE PEAK AND MINIMUM POOL BOILING HEAT FLUXES.
V. K. Dhir. Nov 72, 72p NASA-CR-134492, UKY-BU100
Contract NGR-18-001-035

Descriptors: *Film boiling, *Heat flux, *Viscous fluids, Hydrodynamics, Liquid-vapor interfaces, Wavelengths.

For abstract, see STAR 1122

N73-31253/0GA PC$3.75/MF$1.45
Illinois Univ., Urbana. Mechanical Engineering Dept.
A STUDY OF THE LOCAL PRESSURE FIELD IN TURBULENT SHEAR FLOW AND ITS RELATION TO AERODYNAMIC NOISE GENERATION.
Status Report, 31 Jul. 1972 - 31 Jan. 1973.
B. G. Jones, and H. P. Planchon, Jr.. 31 Jan 73, 35p NASA-CR-134493, SR-5
Contract NGR-14-005-149

Descriptors: *Aerodynamic noise, *Pressure distribution, *Shear flow, *Turbulent flow, Error analysis, Pressure measurements, Pressure sensors, Wind tunnel tests.

For abstract, see STAR 1122

N73-31254/8GA PC$5.50/MF$1.45
Technische Univ., Berlin (West Germany). Sonderforschungsbereich Magnetohydrodynamik.
FRICTIONLESS EQUILIBRIUM FLOW OF SINGLE PHASE - TWO PHASE MIXTURES WITH LOW VAPOR CONTENT IN CONVERGENT-DIVERGENT NOZZLES (ISENTROPIC EVAPORATION EXPANSION).
H. Staedtke. Mar 73, 69p SFB-MHD-5
In German; English Summary.

Descriptors: *Convergent-divergent nozzles, *Isentropic processes, *Two phase flow, Equilibrium flow, Evaporation, Friction, Liquid-gas mixtures, Nozzle flow.

For abstract, see STAR 1122

N73-31255/5GA PC$6.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Freiburg (West Germany). Inst. fuer Angewandte Mathematik und Mechanik.
AN INTEGRAL METHOD FOR THE COMPUTATION OF LAMINAR AND TURBULENT INCOMPRESSIBLE BOUNDARY LAYERS OF FLOW AND TEMPERATURE.
Ph.D. Thesis - Karlsruhe Univ., West Ger.
B. Schulz-jander. 1973, 77p DLR-FB-73-24
In German; English Summary.

Descriptors: *Incompressible boundary layer, *Integral equations, *Laminar boundary layer, *Turbulent boundary layer, Flow distribution, Heat transfer, Prandtl number, Pressure gradients, Temperature distribution, Temperature gradients.

For abstract, see STAR 1122

N73-31256/3GA PC$6.25/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany). Inst. fuer Luftstrahlantriebe.
SECOND ORDER BOUNDARY LAYER THEORY FOR STEADY, LAMINAR, COMPRESSIBLE FLOWS OVER CURVED SURFACES GRENZSCHICHTTHEORIE ZWEITER ORDNUNG FUER STATIONAERE, LAMINARE, KOMPRESSIBLE STROEMUNGEN AN GEKRUEMMTEN OBERFLAECHEN.
Ph.D. Thesis - Tech. Univ., Berlin.
R. Gundmann. 12 Jan 73, 81p DLR-FB-73-31
In German; English Summary.

Descriptors: *Compressible flow, *Flow equations, *Laminar flow, *Rotating bodies, *Thermal boundary layer, Boundary layer separation, Camber, Finite difference theory, Laminar boundary layer, Pressure gradients, Steady flow.

For abstract, see STAR 1122

N73-31258/9GA PC$3.25/MF$1.45
Politecnico di Torino (Italy). Istituto di Macchine e Motori per Aeromobili.
NUMERICAL COMPUTATION OF ONE-DIMENSIONAL UNSTEADY FLOW IN CHANNELS.
M. Pandolfi. Apr 73, 22p PUBL-138

Descriptors: *Channel flow, *Numerical integration, *One dimensional flow, *Shock discontinuity, *Unsteady flow, Boundary value problems, Cavities, Finite difference theory, Shallow water, Water flow.

For abstract, see STAR 1122

N73-31422/1GA PC$3.00/MF$1.45
Max-Planck-Institut fuer Stroemungsforschung, Goettingen (West Germany).
DETERMINATION OF THE SIGN OF THE VELOCITY COMPONENTS OF THE LASER DOPPLER ANEMOMETER.
W. J. Hiller, and G. E. A. Meier. Oct 72, 11p REPT-1/1972
Language in German.

Descriptors: *Anemometers, *Differential interferometry, *Flow velocity, *Velocity measurement, Doppler effect, Lasers, Light scattering, Phase shift, Polarity.

For abstract, see STAR 1122

N73-31423/9GA PC$3.75/MF$1.45
Max-Planck-Institut fuer Stroemungsforschung, Goettingen (West Germany).
THE SCATTERED LIGHT COMPARATIVE BEAM ANEMOMETER, A LASER ANEMOMETER FOR THE MEASUREMENT OF THREE VELOCITY COMPONENTS.
W. J. Hiller, and G. E. A. Meier. Jul 72, 35p REPT-3/1972
In German; English Summary.

Descriptors: *Anemometers, *Light scattering, *Velocity measurement, Differential interferometry, Doppler effect, Flow velocity, Lasers, Self alignment.

For abstract, see STAR 1122

N73-31702/6GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ANALYSIS OF A WATER TABLE SIMULATION OF A TRANSPIRATIONALLY COOLED NOZZLE.
A. F. Kascak. Oct 73, 26p NASA-TM-X-2884, E-7524

Descriptors: *Boundary layer flow, *Hydromechanics, *Sweat cooling, Acceleration (Physics), Heat transfer, Nozzle flow.

For abstract, see STAR 1122

N73-31703/4GA PC$4.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany). Inst. fuer Angewandte Gasdynamik.
METHODS AND APPARATUS FOR THE RESEARCH OF INJECTION PROCESSES IN STREAMING MEDIA METHODEN UND ANLAGEN ZUR UNTERSUCHUNG VON EINSPRITZVORGAENGEN IN STROEMENDE MEDIEN.
K. Wanders, and H. Wiegand. 5 Jul 72, 39p DLR-MITT-72-19
In German; English Summary.

Descriptors: *Drops (Liquids), *Fluid flow, *Liquid injection, *Particle size distribution, Densitometers, Fuel injection, Holography.

For abstract, see STAR 1122

PB-224 470/5GA PC-GPO/MF$1.45-NTIS
Federal Highway Administration, Washington, D.C. Office of Research.
COMPUTATION OF UNIFORM AND NONUNIFORM FLOW IN PRISMATIC CONDUITS.
Final rept.,
Paul N. Zelensky. Nov 72, 63p
Paper copy available from GPO $1.25 as stock no. 500-00038.

Descriptors: (*Pipe flow, Computation), (*Hydraulic engineering, *Prismatic bodies), Viscosity, Flow fields, Drag, Tables(Data), Geometric forms, Problem solving, Materials, Water conduits.
Identifiers: Unsteady flow.

Tables of geometric and hydraulic factors are presented for closed conduit shapes commonly encountered in water conveyance engineering. The tables provide for different degrees of resistance to flow resulting from different materials used in construction. The methods provide solutions for geometrically similar conduits as circular, oval, and square pipes. Solutions for conduits not geometrically similar, as rectangular and pipe-arch are also included. The tables and methods presented facilitate the rapid completion of design calculations by slide rule or mechanical calculators. In addition, the tables of hydraulic factors may be used for simplification of computer operations, especially for nonuniform flow problems.

SLA-73-30/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
FORMULATION OF THE THREE-DIMENSIONAL HYPERSONIC VISCOUS SHOCK-LAYER PROBLEM. PART I. GOVERNING EQUATIONS AND GEOMETRICAL FORMULAS.
J. B. Moreno. Jun 73, 57p

Descriptors: (*Shock waves, *Hypersonic flow), Boundary conditions, Friction, Heat transfer, Layers, Three-dimensional calculations.

For abstract, see NSA 28 07, number 17803.

SLA-73-5452/GA PC$3.00/MF$1.45
Aerotherm Corp., Mountain View, Calif. Sandia Labs., Albuquerque, N. Mex.
GENERALIZED ABLATIVE FLOW IN GAPS AND SLOTS.
L. Cooper, and K. E. Putz. 1972, 12p CONF-730716-1

Descriptors: (*Space vehicles, *Reentry), (*Compressible flow, *One-dimensional calculations), Ablation, Aerodynamics, Boundary layers.

For abstract, see NSA 28 07, number 17809.

SLA-73-628/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
DEVELOPMENT AND COMPARISON OF SEVERAL ANALYTICAL MODELS FOR THE PLANAR TURBULENT NEAR WAKE IN SUPERSONIC FLOW COMBINING COMPONENT AND CRITICAL POINT METHODS.
J. H. Smith. Jul 73, 146p

Descriptors: (*Supersonic flow, *Turbulence), (*Computer codes, *N codes), Planning.

For abstract, see NSA 28 08, number 20586.

20E. Masers and Lasers

AD-768 364/2GA PC$2.75/MF$1.45
Esso Research and Engineering Co Linden N J Government Research Lab
HEAT PIPE COPPER VAPOR LASER.
Semi-annual technical rept. 1 Feb-30 Sep 73,
Robert J. L. Chimenti. 8 Oct 73, 8p Rept no. GRUS.1REOA.73
Contract N00014-73-C-0317, ARPA Order-1806

Descriptors: (*Gas lasers, Design), Copper, Heaters.
Identifiers: *Metal vapor lasers, *Copper lasers.

The report describes the development of a heat pipe copper vapor laser with radial discharge excitation and operating temperatures to 2000C. (Author)

AD-768 485/5GA Reprint
Arizona Univ Tucson Dept of Physics
SENSITIVE METHOD FOR THE DETECTION OF LASER INDUCED DAMAGE TO THIN FILM COATINGS,
Sastry V. Pappu, Chandler Kennedy, and Marlan O. Scully. 5 May 72, 4p AFOSR-TR-73-1844
Grant AF-AFOSR-1921-70
Availability: Pub. in Applied Optics, v11 n8 p1879 Aug 72.

Descriptors: (*Lasers, Optical equipment components), (*Mirrors, Optical coatings), (*Optical coatings, Radiation damage), Measurement, Test methods.
Identifiers: Themis project, Neodymium glass lasers.

A sensitive method is described for detecting laser-induced damage to dielectric coatings. This method can detect damage which would not be visible under microscopic examination and could not be detected by usual spectrophotometric methods. The method involves monitoring the intensity of chopped He-Ne laser light reflected from the mirror coating. (Author)

AD-768 487/1GA Reprint
Arizona Univ Tucson Dept of Physics
WHY IS THE LASER LINE SO NARROW. A THEORY OF SINGLE-QUASIMODE LASER OPERATION,
Roy Lang, Marlan O. Scully, and Willis E. Lamb, Jr. 28 Jul 72, 12p AFOSR-TR-73-1836
Grant AF-AFOSR-1921-70
Availability: Pub. in the Jnl. of Physical Review A, v7 n5 p1788-1797 May 73.

Descriptors: (*Lasers, Theory), Quantum mechanics, Electromagnetic fields, Field theory, Polarization, Coherent radiation, Line spectrum.

Previous theories of laser radiation have described the electromagnetic field in terms of a discrete set of quasimodes (Fox and Li 'modes') of the laser cavity. Each quasimode was assumed to have a finite quality factor Q. In steady state (when gain due to lasing atoms cancels the losses) and in the absence of noise sources, the semiclassical theory predicts a delta-dunction line shape. In the present semiclassical analysis (fluctuations are ignored), this theory is generalized for a maser with a cavity having a semitransparent wall as one of the mirrors so that there are now many modes of the universe corresponding to each Fox-Li-type quasimode. It is demonstrated that the normal modes of the universe associated with a single Fox-Li 'mode' may, under proper conditions, lock together and the delta-function laser line shape may be regained. Specifically, the conditions under which the coupled multimode equations associated with laser oscillation can be reduced to an equation of the form found in the usual single-quasimode theory is investigated. (Author)

AD-768 506/8GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Physics
STIMULATED COMPTON SCATTERING AS A RADIATION SOURCE: THEORETICAL LIMITATIONS,
Vikas P. Sukhatme, and P. A. Wolff. 1 Dec 72, 6p AFOSR-TR-73-1831
Grant AF-AFOSR-2010-71
Availability: Pub. in the Jnl. of Applied Physics, v44 n5 p2331-2334 May 73.

Descriptors: (*Irasers, Theory), (*Coherent radiation, Compton scattering), Lasers, Electron beams, Backscattering, Gain, Quantum mechanics.
Identifiers: Far infrared radiation, Tunable lasers, Carbon dioxide lasers, Neodymium lasers.

Several authors have considered the possibility of using stimulated Compton scattering for obtaining laser action. To date, all gain calculations for these devices have assumed an infinite interaction region. The purpose of this paper is to consider the effect of a finite geometry on the gain. It is found that in most experimental situations the gain is significantly reduced, to the point where stimulated Compton scattering seems unlikely. (Author)

AD-768 546/4GA Reprint
Illinois Univ Urbana Dept of Electrical Engineering
NEW OPTICALLY PUMPED FAR-INFRARED LASERS,
T. K. Plant, P. D. Coleman, and T. A. Detemple. 3 May 73, 3p AFOSR-TR-73-1933
Grant AF-AFOSR-2154-72
Availability: Pub. in the IEEE Jnl. of Quantum Electronics, vOE-9 n9 Sep 73.

Descriptors: (*Gas lasers, Pumping(Optical)), (*Irasers, Pumping(Optical)), Methanols, Formic acids, Ethylenes, Glycols, Methylal, Amines, Electron transitions, Polarization, Tables.
Identifiers: Far infrared radiation, *Laser materials, Formic acid lasers, Methyl alcohol, Ethylene glycol, Methyl ether, Methylamine, Carbon dioxide lasers.

Ninety-seven new far-infrared (FIR) laser transitions have been observed in optically pumped ethylene glycol, dimethyl ether, formic acid, and monomethyl amine, all excited by a pulsed CO2 laser. (Author)

AD-768 547/2GA Reprint
Illinois Univ Urbana Dept of Electrical Engineering
INTENSE SUPERRADIANT EMISSION AT 496 MICRONS FROM OPTICALLY PUMPED METHYL FLUORIDE,
T. A. DeTemple, T. K. Plant, and P. D. Coleman. 20 Feb 73, 6p AFOSR-TR-73-1828
Grant AF-AFOSR-2154-72
Availability: Pub. in Applied Physics Letters, v22 n12 p644-646, 15 Jun 73.

Descriptors: (*Gas lasers, Pumping(Optical)), (*Pumping(Optical), Fluorine compounds), Irasers, Halogenated hydrocarbons, Gain, Light pulses.
Identifiers: Far infrared radiation, Carbon dioxide lasers, *Methane/Fluoro.

Intense superradiant emission has been observed from methyl fluoride excited by 0.6 MW pulses from a high-pressure CO2 laser. Pulses of approximately 1 kW with a duration of approximately 150 nsec have been obtained from a 5 m long 40 mm diam cell containing 0.7 Torr of methyl fluoride. This output represents an efficiency of converting infrared photons to far-infrared photons of approximately 5%. Evidence for partial waveguiding in the cell and for phase-coherent amplification are presented. (Author)

AD-768 578/7GA Reprint
Washington Univ St Louis Mo Dept of Physics
QUANTUM THEORY OF NONLINEAR OPTICAL PROCESSES WITH TIME-DEPENDENT PUMP AMPLITUDE AND PHASE: FREQUENCY CONVERSION,
Eugene Y. C. Lu. 22 Dec 72, 11p AFOSR-TR-73-1796
Contract F44620-69-C-0121
Availability: Pub. in Physical Review A, v8 n2 p1053-1061 Aug 73.

Descriptors: (*Coherent radiation, Frequency converters), Quantum mechanics, Perturbation theory, Quantum statistics, Operators(Mathematics), Pumping(Optical), Lasers, Nonlinear systems.
Identifiers: Nonlinear optics, Density matrix.

The behavior of a simple theoretical model of a quantun-frequency converter with a time-dependent pump amplitute and phase is analyzed quantum mechanically. A sufficient condition ensuring periodic frequency conversion between the modes

is found and exact solutions are given in these cases. The complete time-dependent density matrices which give the most complete statistical description of the system are presented for a variety ot initial states of the system. In the general case where the sufficient condition is not satisfied, time-dependent-perturbation-theory results give corrections to the amplitude and the period of the energy exchange between the modes. Comparisons are made between these results and those of other authors. (Author)

AD-768 587/8GA Reprint
California Univ Berkeley Coll of Engineering
SECOND-HARMONIC GENERATION OF SEVERAL ARGON-ION LASER LINES,
R. K. Jain, and T. K. Gustafson. 30 Apr 73, 5p
AFOSR-TR-73-1887
Contract F44620-71-C-0087
Availability: Pub. in IEEE Jnl. of Quantum Electronics, vQE9 n8 p859-861 Aug 73.

Descriptors: (*Gas lasers, Ultraviolet radiation), (*Coherent radiation, Frequency multipliers), Ammonium compounds, Hydrogen compounds, Phosphates, Harmonic analysis.
Identifiers: *Second harmonic generation, *Argon lasers, Ion lasers, Ultraviolet lasers, Nonlinear optics, *Ammonium dihydrogen phosphate.

Second-harmonic generation of the 496.5-nm, 501.7-nm, and 514.5-nm lines of the argon laser has been achieved. This was done by 90 degree phase matching in an ADP crystal at temperatures of -93.2C, -68.4C, and -10.2C, respectively. (Author)

AD-768 621/5GA PC$3.75/MF$1.45
Raytheon Co Waltham Mass Research Div
VISIBLE AND INFRARED LASER-INDUCED DAMAGE TO TRANSPARENT MATERIALS.
Semiannual technical rept. 1 Jan-30 Jun 73,
Michael Bass, David W. Fradin, and Domenic P. Bua. Sep 73, 93p Rept no. S-1593 AFCRL-TR-73-0494
Contract F19628-73-C-0127, ARPA Order-1434

Descriptors: (*Lasers, Optical materials), (*Optical materials, Radiation damage), Gas lasers, Irasers, Focusing, Quartz, Sodium chloride, Dielectric films, Optical coatings.
Identifiers: Laser beams, Laser materials, Self focusing, Neodymium lasers, YAG lasers, Carbon dioxide lasers, Ruby lasers.

By using Q-switched and mode-locked Nd:YAG lasers, the authors have measured the dependence of intrinsic damage fields on both lattice disorder and laser pulse duration and have interpreted the results in terms of avalanche breakdown. It was found that severe lattice disorder such as present in fused silica measurably increases the intrinsic damage intensity. The breakdown field was also found to increase when the pulse duration was reduced below about 1 ns. Damage from inclusions was observed in various dielectric coatings. It was found that inclusions having diameters approximately 3.5 micrometers were responsible for damage from Q-switched pulses and that inclusions with diameters less than approximately 0.4 micrometers were responsible for threshold damage from 20 ps mode-locked pulses. An operating CO2 TEA laser has been assembled for use as a source for damage measurements. Future cavity refinements are needed to restrict lasing to a TEM(00) mode with peak powers in excess of about 150 KW. (Author)

AD-768 674/4GA PC$3.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
LASER DAMAGE IN DIELECTRIC COATINGS--IDENTIFICATION OF INCLUSIONS AS THE LIMITING DAMAGE MECHANISM AND FIRST OBSERVATION OF INTRINSIC DAMAGE IN DIELECTRIC COATINGS.
Physical sciences research papers, 1 Jan-30 Jun 73,
D. Milam, R. A. Bradbury, R. H. Picard, and M. Bass. 10 Jul 73, 41p Rept nos. AFCRL-TR-73-0406, AFCRL-PSRP-553
ARPA Order-1434

Descriptors: (*Lasers, Optical equipment components), (*Optical coatings, Radiation damage), (*Dielectric films, Radiation damage), Coherent radiation, Optical materials, Defects(Materials).
Identifiers: Laser beams, Laser materials.

Inclusion damage due to metallic or highly absorbing inclusions has been conclusively identified as the practical limitation in the threshold for laser-induced dielectric film damage at the wavelength 0.69 micrometer. The predicted 'pulse duration-inclusion size' relationship has been observed. It has been shown that linear absorption is not a limiting damage mechanism when films are properly prepared from materials which do not shown bulk absorption. The first verified observation of intrinsic damage in dielectric films is discussed. (Author)

AD-768 752/8GA PC$3.00/MF$1.45
Naval Ordnance Lab White Oak Md
A NUMERICAL ANALYSIS OF CO2 LASER RADIATION ABSORPTION IN SF6-AIR LAMINAR BOUNDARY LAYERS,
John D. Anderson, Jr. 12 Jul 73, 43p Rept no. NOLTR-73-143

Descriptors: (*Light transmission, Laminar boundary layer), (*Coherent radiation, Absorption), Two-dimensional flow, Gas lasers, Irasers, Partial differential equations, Sulfur compounds, Fluorides, Air.
Identifiers: Carbon dioxide lasers, *Laser beams, Atmospheric attenuation, Sulfur hexafluoride *Gas dynamics.

Numerical results are presented for the radiative gasdynamic interaction associated with CO2 laser radiation absorption in SF6-air laminar compressible boundary layers. Detailed boundary layer profiles and the variation of radiative intensity are obtained for the sonic flow over a flat plate at sea level, wherein SF6 is injected into the boundary layer through the surface, and CO2 laser radiation at 10.6 micrometers is incident on the plate downstream of the injection. The numerical solution of the non-similar boundary layer equations employs a difference-differential technique. (Modified author abstract)

AD-769 040/7GA PC$11.25/MF$1.45
Avco Everett Research Lab Inc Everett Mass
PULSED CHEMICAL LASER SCIENCE AND TECHNOLOGY.
Final rept. 8 Nov 71-1 Dec 72.
Oct 73, 185p AFWL-TR-73-40
Contract F29601-72-C-0017, ARPA Order-870

Descriptors: (*Gas lasers, Fluorides), (*Light pulses, Gas lasers), Chemical reactions, Electron beams, Molecular energy levels, Chemiluminescence, Programming(Computers), Relaxation time, Hydrogen compounds, Refractive index, Absorption, Irasers.
Identifiers: *Hydrogen fluoride lasers, Atom molecule interactions, Cross sections, Molecular vibration, Pulsed lasers, *Chemical lasers.

Research is described on a pulsed chemical laser operating on the reaction between hydrogen and fluorine at pressures above the second explosion limit. Laser energy density and efficiency are reported. The highest vibrational level observed to give laser action is v = 6, and it is concluded that rapid deactivation of the upper vibrational levels initial F-atom concentration required for good laser performance, overall electrical efficiencies of greater than 100% are predicted. Attempts have also been made to develop (1) fast yet accurate computer programs which contain the essential physics for the calculation of the vibration-relaxation cross section in an atom molecule collision, and (2) theoretical model of the propagation of a collimated pulsed laser beam in an absorbing medium. The energy absorbed by the medium causes heating, leading to an index-of-refraction change which causes a self-defocusing. (Modified author abstract)

AD-769 067/0GA PC$3.00/MF$1.45
Hughes Research Labs Malibu Calif
FREQUENCY TUNED CO2 LASER.
Semiannual technical rept. 19 Mar-31 Sep 73,
R. L. Abrams. Oct 73, 48p
Contract N00014-73-C-0324, ARPA Order-1809

Descriptors: (*Gas lasers, Design), (*Irasers, Design), Tuning devices, Waveguides, Opdar, Performance(Engineering).
Identifiers: *Carbon dioxide lasers, Waveguide lasers, Tunable lasers.

The program represents an effort to develop a stable, tunable CO2 laser with a tuning range of plus or minus 750 MHz. In order to increase the tuning range of a CO2 laser beyond the 50 to 100 MHz doppler broadening limited value, it is necessary to increase the gain linewidth. The technical approach taken here is to raise the operating laser pressure and thus broaden the gain linewidth. The linewidth broadens at the rate of 5.3 MHz/Torr and equals 1500 MHz at 283 Torr. High pressure operation is achieved by operating the laser in the waveguide mode, and thus using a small capillary bore as the gas discharge region. (Modified author abstract).

AD-769 103/3GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs Richland Wash
INVESTIGATE MATERIAL SYSTEMS FOR MIRRORS USED IN HIGH POWER CO AND CO2 LASERS.
Semiannual technical rept.,
R. W. Stewart. Aug 73, 37p Rept no. BNWL-1781
Contract N00123-72-C-2215, ARPA Order-2175

Descriptors: (*Gas lasers, *Mirrors), (*Irasers, Mirrors), Infrared optical systems, Copper, Manufacturing methods.
Identifiers: *Carbon monoxide lasers, *Carbon dioxide lasers.

An IR metal mirror with up to approximately 99.2% reflectivity and a surface roughness of about 15 A rms was developed using high-rate sputter-deposition techniques. The necessary smooth, high-conductivity surface was obtained by applying two sequentially deposited metal layers on a high-conductivity metal mirror support (OFHC). The principal property of the first deposit was its polishability and of the second its high electrical conductivity. The required smooth surface was obtained by depositing and mechanically polishing a dispersion-hardened (1 vol.%SiC in Cu), stable, fine-grained material about 0.5 mm thick. (Modified author abstract)

JPRS-60244/GA PC$3.25/MF$1.45
Joint Publications Research Service, Arlington, Va.
NUCLEAR PUMPING IN MOLECULAR GAS LASERS,
V. M. Andriyakhin, V. V. Vasiltsov, S. S. Krasilnikov, and V. D. Pismennyi. 10 Oct 73, 22p
Trans. of Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki (USSR) v63 n5 p1635-1644 1972.

Descriptors: (*Gas lasers, Excitation), (*Carbon dioxide lasers, Excitation), Gas ionization, Atomic energy levels, Elctron Transitions, Translations, USSR.
Identifiers: *Irasers.

The report contains an examination of the mechanism of the populating of vibrational levels of molecules by electrons produced during the ionization of a gas by the products of nuclear reactions or by a beam of charged particles.

LA-5151-MS(Suppl.1)/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
CO SUB 2 GAS LASER STUDIES.
C. B. Mills. Jun 73, 16p
Contract W-7405-eng-36

Descriptors: (*Lasers, *Gain), (*Carbon dioxide, *Energy levels), (*Helium, Energy levels), (*Nitrogen, Energy levels), Boltzmann equation, Excitation, Laser radiation, Transport theory.

For abstract, see NSA 28 08, number 20621.

N73-30480/0GA PC$4.25/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Stuttgart (West Germany). Inst. fuer Reaktionskinetik.
REACTION-KINETICS CALCULATIONS OF A CO2-N2-HE GASDYNAMIC LASER.
P. Roth. 27 Mar 72, 43p DLR-FB-72-21
In German; English Summary.

Descriptors: *Carbon dioxide lasers, *Laser outputs, *Population inversion, *Reaction kinetics, Energy transfer, Gas expansion, Gas mixtures, Helium, Molecular energy levels, Molecular relaxation, Nitrogen, Nozzle flow, Optical resonators.

For abstract, see STAR 1121

PATENT-3 521 189/GA Not available NTIS
Department of the Navy Washington D C
MULTIPLE CRYSTAL HIGH POWER LASER DESIGN.
Patent,
Harold R. Koenig. Filed 3 Jan 67, patented 21 Jul 70, 3p Rept nos. PAT-APPL-607 358,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Lasers, *Patents), Pumping(Optical).
Identifiers: PAT-CL-331-94-5, Face pumped lasers.

The invention relates to a laser system and more particularly to a face pumped laser with an improved means for synchronous face pumping a plurality of spaced laser discs wherin the pump energy is filtered and diffused to pass only desired frequencies of electromagnetic radiation to the discs.

20F. Optics

AD-768 484/8GA Reprint
Arizona Univ Tucson Dept of Physics
TOOLS OF THEORETICAL QUANTUM OPTICS,
Marlan O. Scully, and Kenneth G. Whitney. 1972, 35p AFOSR-TR-73-1830
Grant AF-AFOSR-1921-70
Availability: Pub. in Progress in Optics, v10 ch3 p91-135 1972.

Descriptors: (*Optics, Quantum mechanics), Green's function, Operators(Mathematics), Matrix algebra.
Identifiers: *Quantum optics, Density matrix, Quantum noise.

In the last several years three different theoretical techniques have been used extensively in quantum optical problems, to wit, density matrix, Green's function, and quantum noise operator techniques. However, while many workers use one or the other of these approaches most do not include all three in their 'tool boxes'. It is the purpose of the review to give a simple discussion of each while demonstrating some of their strengths and interconnections. The authors propose to accomplish this by treating the well-known problem of a single mode of the radiation field coupled to a reservoir using the density matrix, Green's function and quantum noise operator approaches. This enables simple comparisons to be made between these theoretical approaches and to see clearly how they provide equivalent complementary descriptions of the reservoir interaction. Comments on the density matrix and Green's function descriptions of more complicated problems are included in two appendices. (Modified author abstract)

AD-768 530/8GA Reprint
Arizona Univ Tucson Dept of Physics
ELECTRO-OPTICS: THE CONCEPT OF THE PHOTON,
Marlan O. Scully, and Murray Sargent, III. 1972, 13p AFOSR-TR-73-1837
Grant AF-AFOSR-1921-70
Availability: Pub. in Physics Today, v25 n3 p38-47 Mar 72.

Descriptors: (*Photons, Quantum mechanics), Coherent radiation, Electron transitions, Fluorescence, Photoelectric effect, Wave functions, Field theory, Electric fields, Magnetic fields.
Identifiers: Quantum electronics, Quantum electrodynamics.

The photon concept is discussed. The photon concept as contained in the quantum theory of radiation provides the basis for explaining all known electromagnetic phenomena. However, the 'fuzzy-ball' picture of a photon often leads to unnecessary confusion. Most quantum and electro-optical physics is well understood and quantitatively explained semiclassically. (Author)

AD-768 631/4GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
DISPERSION OF PLANE GRATING SPECTROMETERS,
G. T. Best. 18 Apr 73, 1p Rept no. AFCRL-TR-73-0575
Availability: Pub. in Applied Optics, v12 n8 p1751 Aug 73.

Descriptors: (*Spectrometers, Optical properties), Scattering, Dispersion relations.

The grating equations are applied to the Czerny-Turner and Ebert configurations and a simple procedure for determining the reciprocal dispersions is given. The effect on light-gathering power is discussed. (Author)

AD-768 743/7GA PC$3.00/MF$1.45
Naval Air Development Center Warminster Pa Aero-Electronic Technology Dept
TRANSMISSIVE SIMILARITY AND SCALE MODELS IN A LIGHT ABSORBING, RANDOMLY SCATTERING MEDIUM.
Technical note,
Cyrus Beck. 9 Oct 73, 13p Rept no. NADC-73135-20

Descriptors: (*Light transmission, Scattering), Dispersion relations, Underwater light, Atmosphere, Absorption spectrum, Partial differential equations.

The concept of transmissive similarity is introduced and explained. Some basic laws governing similarity in a light absorbing, randomly shallow angle scattering, macroscopically homogeneous medium are derived in terms of the absorption coefficient and the dispersion (not scattering) coefficient. Absorptive and dispersive similarity are subsumed under transmissive similarity. Applying the similarity laws developed, the procedure is presented for determining the optical properties of the medium required to obtain the desired scale model. Three examples illustrate the method. The transmissive partial differential equation is given in dimensional and dimensionless form. (Author)

AD-768 783/3GA PC$3.00/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
INTENSITY INTERFEROMETRY IN THE SPATIAL DOMAIN(II),
Paul H. Deitz, and F. Paul Carlson. Sep 73, 29p Rept no. BRL-1668
Presented at the Spring Meeting of the Optical Society of America, Denver, Colo., 13-16 Mar 73. Pub. in Jnl. of the Optical Society of America, Mar 73. See also report dated Oct 72, AD-752 902.

Descriptors: (*Light transmission, Atmosphere), Scintillation, Coherent radiation, Intensity, Statistical functions, Integral transforms.
Identifiers: Laser beams, Far field, Helium neon lasers.

Intensity interferometry, as developed by Hanbury Brown and Twiss for stellar observation, has shown relative insensitivity to atmospheric scintillation. However, with classical sources, the limitations placed on this technique by quantum noise and detector efficiency are severe. This situation is vastly improved when laser illumination is employed. Generalizing a form of the mutual coherence function, the authors derive the far-zone behavior of the mutual intensity function for an intermediate time average. This result is used to reconstruct the irradiance distribution of a spatially rough source. The far-field intensity distribution is recorded spatially for one time-resolution unit of the detector. The resulting spatial signal is autocorrelated and related to the intensity distribution over the source. Thus, without averaging in the time domain, a spatial Fourier-transform relation is derived between the far-field intensity correlation and the source irradiance, similar to the results of Hanbury Brown and Twiss. (Modified author abstract)

AD-768 972/2GA PC$4.25/MF$1.45
Hughes Research Labs Malibu Calif
LASER-INDUCED DAMAGE IN OPTICAL MATERIALS.
Semiannual technical rept. no. 2,
Concetto R. Giuliano. Jul 73, 44p AFCRL-TR-73-0528
Contract F19628-72-C-0348, ARPA Order-2042
See also report dated Jan 73, AD-760 131.

Descriptors: (*Optical materials, Radiation damage), Coherent radiation, Lasers, Irasers, Sapphires, Silver compounds, Arsenic compounds, Sulfides, Lithium compounds, Niobates.
Identifiers: Neodymium lasers, YAG lasers, Ruby lasers, *Laser materials, Proustite, Silver sulfides, Arsenic sulfides, Lithium niobates.

The report contains the results of damage experiments performed at 0.694 and 1.06 micrometer using well controlled ruby and Nd:YAG lasers. Materials studied at 1.06 micrometer are proustite (Ag3AsS3) and lithium niobate (LiNbO3). Proustite studies have been directed toward improving surface quality by employing different polishing techniques. Little or no improvement has been obtained over previously measured thresholds. Chemical changes in proustite damage sites are evidenced by the use of electron excited x-ray microprobe measurements. Preliminary ion beam polishing experiments were performed on LiNbO3, but no improvement in damage threshold was observed. However, the damage in this material appears to be inclusion limited in the samples studied so far. The temporal and spatial characteristics of laser pulses were studied for transmitted, reflected, and backscattered pulses both above and below surface damage threshold. (Modified author abstract)

AD-769 003/5GA PC$3.75/MF$1.45
Bendix Research Labs Southfield Mich
COHERENT OPTICAL IMAGE-PLANE CORRELATOR STUDY.
Final rept. Nov 71-Mar 73,
Daniel C. Kowalski. Aug 73, 68p Rept no. BRL-6514 RADC-TR-73-240

Contract F30602-72-C-0108

Descriptors: (*Optical images, Correlators), (*Photogrammetry, Optical equipment), Design, Stereoscopic photography, Aerial photography, Statistical functions, Real time, Gas lasers.
Identifiers: Image processing, Optical data processing, Performance evaluation, Argon lasers.

A coherent optical image-plane correlator has been evaluated for use in automating stereo-perception in stereophotogrammetric instruments. A previously developed breadboard correlator was modified to incorporate real-time control functions as required for automatic stereo-perception. With stereo-photographs of a laboratory stereomodel, the correlator, successfully demonstrated its profiling capability by automatically clearing x and y parallax and correcting x-scale due to slope. With typical stereo aerial photography, inconsistent plotting performance was experienced. This result is attributed to the inadequacy of the simple control loops of the experimental correlator to cope with the spatially variant properties of aerial photography. While this problem could be overcome, it is recommended that subsequent effort be directed toward a different type of optical system which would make maximum use of the power of optical computing techniques while minimizing real-time adaptive control requirements. The approach considered is that of an epipolar coherent optical correlator which would perform parallel multichannel computation of one-dimensional correlation functions. (Author)

CEA-R-4429/GA PC$5.50/MF$1.45
Commissariat a l'Energie Atomique, Limeil-Brevannes (France). Centre d'Etudes.
EXPERIMENTAL STUDY OF RAYLEIGH SCATTERING WITH A RUBY LASER BEAM: RELATIVE VARIATION OF SCATTERED LIGHT WITH THE NUMBER OF SCATTERING CENTERS AND NATURE OF THE GASES.
C. Bayer. Jun 73, 67p
In French. U.S. Sales Only.

Descriptors: (*Laser radiation, *Rayleigh scattering), (*Gases, Rayleigh scattering), Refraction, Ruby.

For abstract, see NSA 28 08, number 20608.

COO-3151-22/GA PC$3.00/MF$1.45
Cornell Univ., Ithaca, N. Y. Lab. Of Atomic and Solid State Physics.
INFRARED WINDOWS FOR USE AT LOW TEMPERATURES.
W. J. Shotts, and A. J. Sievers. Apr 73, 8p
Contract AT(11-1)-3151

Descriptors: (*Spectroscopy, *Far infrared radiation), (*Polyethylenes, *Opacity), (*Germanium, Opacity), Low temperature, Ultralow temperature.

For abstract, see NSA 28 07, number 17753.

N73-30230/9GA PC$3.50/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
THE USE OF DYES FOR WATER TUNNEL FLOW VISUALIZATION.
D. H. Thompson. Feb 73, 29p ARL/A-NOTE-339
Misc-Original Contains Color Illustrations.

Descriptors: *Dyes, *Flow visualization, *Hydraulic test tunnels, Color photography, Flow distribution, Fluid injection.

For abstract, see STAR 1121

N73-31408/0GA PC$7.75/MF$1.45
Perkin-Elmer Corp., Norwalk, Conn.
STELLAR FIGURE SENSOR.
Final Report, Jan. 1972 - Jan. 1973.
W. N. Peters. Apr 73, 112p NASA-CR-132795, REPT-11455
Contract NAS5-23067

Descriptors: *Astronomical telescopes, *Interferometry, *Satellite-borne instruments, Beam splitters, Coherent light, Imaging techniques, Mathematical models, Photometers, Stars.

For abstract, see STAR 1122

N73-31411/4GA PC$5.50/MF$1.45
Colorado Univ., Boulder. Lab. for Atmospheric and Space Physics.
ADVANCED APPLICATIONS FLIGHT EQUIPMENT (AAFE) 125MM ULTRAVIOLET SPECTROMETER.
Final Report.
R. J. Schroeder. May 73, 68p NASA-CR-132266
Contract NAS1-10388

Descriptors: *Ozone, *Spectrometers, *Ultraviolet radiation, Atmospheric composition, Mechanical properties, Optical properties.

For abstract, see STAR 1122

N73-31439/5GA PC$3.00/MF$1.45
Australian Post Office Research Labs., Melbourne.
DEVELOPMENT OF A COATING PROCESS FOR LIQUID FILLED OPTICAL FIBRES.
R. J. Western. May 73, 7p REPT-6803

Descriptors: *Glass fibers, *Optical properties, *Protective coatings, Feasibility analysis, Melting.

For abstract, see STAR 1122

PATENT-3 752 559/GA Not available NTIS
Kollsman Instrument Corp., Syosset, N.Y.
RITCHEY-CHRETIEN TELESCOPE.
Patent.
S. Rosin, and M. Amon. Patented 14 Aug 73, 5p NASA-CASE-GSC-11487-1,
Misc-Filed 29 Oct. 1971 Supersedes N72-20404 (10 - 11, p 1474). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Imaging techniques, *Telescopes, Astigmatism, Flat plates, Focusing, Patents.

A Ritchey-Chretien telescope is described which was designed to respond to images located off the optical axis by using two transparent flat plates positioned in the ray path of the image. The flat plates have a tilt angle relative to the ray path to compensate for astigmatism introduced by the telescope. The tilt angle of the plates is directly proportional to the off axis angle of the image. The plates have opposite inclination angles relative to the ray paths. A detector which is responsive to the optical image as transmitted through the plates is positioned approximately on the sagittal focus of the telescope.

PATENT-3 752 564/GA Not available NTIS
National Academy of Sciences - National Research Council, Washington, D.C.
OPTICAL DATA PROCESSING USING PARABOLOIDAL MIRROR SEGMENTS.
Patent.
A. S. Husain-abidi. Patented 14 Aug 73, 6p NASA-CASE-GSC-11296-1,
Misc-Filed 22 Feb. 1972 Supersedes N72-21662 (10 - 12, p 1642). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Optical data processing, *Paraboloid mirrors, Fourier transformation, Patents.

An optical data processing system using paraboloidal reflecting surfaces is disclosed. In the preferred embodiment the paraboloidal reflecting surfaces are segments of a paraboloidal mirror. A source of coherent light is in the focal plane of the first paraboloidal mirror segment which collimates the beam and reflects it toward a second paraboloidal mirror surface. The information to be analyzed, on a transparency for example, is placed in the collimated beam. The beam is reflected from the second paraboloidal mirror segment and focused on a Fourier transform plane. A photon detector could be placed in the Fourier transform plane or suitable spatial filters, with the filtered beam then being reflected from a third paraboloidal mirror segment to be focused on a reconstruction plane.

20G. Particle Accelerators

ANL-Trans-944/GA PC$11.25/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Experimentelle Kernphysik.
PONDEROMOTIVE STABILITY OF RF RESONATORS AND RESONATOR CONTROL SYSTEMS.
D. Schulze. Nov 72, 181p
Translation of KFK--1493.

Descriptors: (*Cavity resonators, *Control systems), Coupling, Electromagnetic fields, Feedback, Helical waveguides, Instability, Linear accelerators, Rf systems, Stability, Superconductors.

For abstract, see NSA 28 08, number 18980.

ANU-P-572/GA PC$5.75/MF$1.45
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
NOTES ON VACUUM TECHNOLOGY.
T. R. Ophel. 7 May 73, 72p
U.S. Sales Only.

Descriptors: (*Van de graaff accelerators, Vacuum systems), (*Vacuum systems, *Reviews), Beam injection, Cleaning, Gaskets, Philips gages, Specifications, Turbomolecular pumps, Valves.

For abstract, see NSA 28 08, number 18938.

CEA-CONF-2263/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
USE OF MAKROLON AS INSULATING MATERIAL, IN HIGH VOLTAGE TECHNOLOGY.
P. Bernard, and J. Bony. 7 Mar 72, 9p CONF-720350-1
U.S. Sales Only.

Descriptors: (*Saturne, *Ion sources), (*Polycarbonates, *Dielectric properties), Beam injection, Dielectric materials, Drying, Performance.

For abstract, see NSA 28 08, number 18981.

CERN-73-8/GA PC$4.50/MF$1.45
European Organization for Nuclear Research, Geneva (Switzerland).
STUDY OF THE PRESENT EXTRACTION SYSTEM FOR THE CERN SYNCHRO-CYCLOTRON.
S. Lindbaeck. 19 Jun 73, 46p
U.S. Sales Only.

Descriptors: (*Cern synchrocyclotron, *Beam extraction), Beam currents.

For abstract, see NSA 28 07, number 16202.

FRNC-TH-376/GA PC$6.75/MF$1.45
Paris Univ., Orsay (France).

IMPROVEMENT OF THE QUALITY AND TIME CHARACTERISTICS OF THE POLARIZED BEAM OF THE SACLAY CYCLOTRON.
A. Ropert. 1972, 93p
In French. U.S. Sales Only.

Descriptors: (*Isochronous cyclotrons, *Beam injection), Beam acceptance, Beam bunching, Beam emittance, Beam optics, Electrostatic lenses, Focusing, Performance, Polarized beams, Proton beams.

For abstract, see NSA 28 07, number 16203.

KFK-EXT-18/73-1/GA PC$3.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Zyklotron-Laboratorium.
OPERATION OF THE KARLSRUHE ISOCHRONOUS CYCLOTRON IN 1972.
G. Schatz, and F. Schulz. Apr 73, 13p
U.S. Sales Only.

Descriptors: (*Karlsruhe cyclotron, *Operation), Beam injection, Cathodes, Hafnium carbides, Ion sources.

For abstract, see NSA 28 07, number 16193.

LA-UR-73-1000/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
NEWLY DEVELOPED IRRADIATION FACILITY AT LAMPF.
D. J. Dudziak, W. V. Green, T. R. Regenie, and E. G. Zukas. 12p CONF-730910-6

Descriptors: (*Lampf linac, *Neutron sources), Accelerator facilities, Physical radiation effects.

For abstract, see NSA 28 08, number 19155.

LA-UR-73-655/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
STATUS OF THE LOS ALAMOS MESON PHYSICS FACILITY FOR RADIONUCLIDE PRODUCTION.
H. A. Jr. O'Brien. 19p CONF-730542-1

Descriptors: (*Lampf linac, *Isotope production), Accelerator facilities.

For abstract, see NSA 28 08, number 19154.

LA-UR-73-882/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
STATUS OF LAMPF EXPERIMENTAL FACILITIES.
H. A. Thiessen. 1973, 10p CONF-730642-5

Descriptors: (*Lampf linac, *Accelerator facilities), Operation.

For abstract, see NSA 28 07, number 16199.

LA-UR-73-965/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
EFFECTS OF LOAD MISMATCH ON THE HIGH-POWER MULTICAVITY KLYSTRON.
P. J. Tallerico. 10p CONF-730913-1

Descriptors: (*Lampf linac, *Rf systems), Cavity resonators, Klystrons, Operation, Power supplies.

For abstract, see NSA 28 08, number 18982.

LA-5216/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
H SUB 2 -ATMOSPHERE FURNACE-BRAZING AND SOLDERING-OVEN PRODUCTION OPERATION AT LAMPF.
S. P. Koczan, R. L. Rhorer, G. Suazo, and H. G. Worstell. May 73, 26p
Contract W-7405-eng-36

Descriptors: (*Lampf linac, Cavity resonators), (*Cavity resonators, *Fabrication), Brazing, Furnaces, Soldering, Vacuum systems.

For abstract, see NSA 28 07, number 16194.

LA-5306-MS/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
RADIATION-HARDENED MAGNETS USING MINERAL-INSULATED CONDUCTORS.
A. Harvey. Jun 73, 17p
Contract W-7405-eng-36

Descriptors: (*Lampf linac, Electromagnets), (*Electromagnets, *Radiation hardening), Beam bending magnets, Dielectric materials, Magnesium oxides, Quadrupoles.

For abstract, see NSA 28 08, number 19153.

LA-5307-MS/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
LAMPF DATA HANDLING WORKSHOP. INTRODUCTION TO CAMAC.
J. P. Egger. Jun 73, 13p
Contract W-7405-eng-36

Descriptors: (*Lampf linac, *Data acquisition systems), Camac system, Pdp computers.

For abstract, see NSA 28 07, number 16217.

LA-tr-73-38/GA PC$3.25/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr).
PARAXIAL THEORY OF INTENSE RELATIVISTIC ELECTRON BEAMS.
D. Parish, P. I. Ryl'tsev, and V. P. Sarantsev. Apr 73, 23p
Translation of JINR--P9-6700.

Descriptors: (*Electron beams, *Mathematical models), Relativistic range, Space charge.

For abstract, see NSA 28 08, number 19091.

N-73-16677/GA PC$5.45/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
MAGNETIC-FIELD MEASUREMENTS FOR THE LEWIS RESEARCH CENTER CYCLOTRON.
T. E. Fessler. Feb 73, 52p NASA-TM-X-2692, E-6956

Descriptors: (*Cyclotrons, *Magnetic fields).

For abstract, see NSA 28 08, number 19092.

RISO-281/GA PC$3.50/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
ACCELERATOR DEPARTMENT ANNUAL PROGRESS REPORT, 1 JANUARY 1972--31 DECEMBER 1972.
Jan 73, 27p
U.S. Sales Only.

Descriptors: (*Accelerators, *Operation), Denmark, Research programs.

For abstract, see NSA 28 07, number 16196.

RL-73-30/GA PC$3.00/MF$1.45
Rutherford High Energy Lab., Chilton (England).
ENERGY VARIATION FOR E-P COLLISIONS IN EPIC II.
G. H. Rees. May 73, 7p
U.S. Sales Only.

Descriptors: (*Storage rings, *Beam luminosity), (*Electron-positron interactions, *Colliding beams), Beam bunching, Beam optics, Electron beams, Electrons, Energy range, Energy range, Proton beams, Protons, Variations.

For abstract, see NSA 28 07, number 16212.

RL-73-44/GA PC$3.00/MF$1.45
Rutherford High Energy Lab., Chilton (England).
INITIAL STUDIES OF LONGITUDINAL SPACE CHARGE FORCES IN E--P BEAM--BEAM INTERACTIONS FOR BUNCHED AND UNBUNCHED P BEAMS.
G. H. Rees. May 73, 10p
U.S. Sales Only.

Descriptors: (*Storage rings, Electron-positron interactions), (*Colliding beams, Electron-positron interactions), Angular distribution, Beam bunching, Electron beams, Interactions, Proton beams, Space charge, Synchrotron oscillations.

For abstract, see NSA 28 07, number 16213.

RL-73-46/GA PC$3.00/MF$1.45
Rutherford High Energy Lab., Chilton (England).
PATH LENGTH ADJUSTMENT FOR ENERGY VARIATION IN EPIC.
J. D. Lewin. Jun 73, 14p
U.S. Sales Only.

Descriptors: (*Storage rings, *Beam bending magnets), Colliding beams, Deuteron beams, Deuterons, Distance, Electron beams, Energy, Gev range 10-100, Orbits, Proton beams, Specifications, Trajectories, Variations.

For abstract, see NSA 28 07, number 16214.

TID-26368/GA PC$3.00/MF$1.45
Argonne National Lab., Ill.
HIGH-GRADIENT COLUMN COMPUTER PROGRAM CALLED KALUM.
G. A. Concaildi, and R. D. George. 1 Mar 73, 6p

Descriptors: (*Computer codes, K codes), (*K codes, Electrostatic accelerators), (*Electrostatic accelerators, *Electric fields), Electric potential, Electrodes.

For abstract, see NSA 28 08, number 19093.

TID-26370/GA PC$3.00/MF$1.45
Argonne National Lab., Ill.
OPERATION MANUAL FOR PROGRAM "NUWIE".
G. A. Concaildi. 17 Apr 73, 8p

Descriptors: (*Computer codes, N codes), (*N codes, Beam monitoring), (*Beam monitoring, Computer codes), Beam emittance, Beam position.

For abstract, see NSA 28 08, number 18984.

UCID-16299/GA PC$3.25/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
POSSIBLE COHERENT ELECTROMAGNETIC EFFECTS IN THE LOS ALAMOS PROTON STORAGE RING.
V. K. Neil, and R. K. Cooper. 4 Jun 73, 21p
Contract W-7405-eng-48

Descriptors: (*Storage rings, *Beam dynamics), Coherent radiation, Lampf linac, Protons, Space charge.

For abstract, see NSA 28 08, number 19124.

UJF-2923-F/GA PC$3.00/MF$1.45
Ceskoslovenska Akademie Ved, Rez. Ustav Jaderneho Vyzkumu.
DYNAMICS OF THE MOTION OF IONS IN THE MEDIAN PLACE OF AN ISOCHRONOUS ROTATIONAL SYMMETRICAL MAGNETIC FIELD, TAKING ACCOUNT OF THE EFFECT OF THE ELECTRICAL FIELD.
M. Kuzmiak, I. Goloubek, and A. Grda. May 73, 11p

In Russian.

Descriptors: (*Isochronous cyclotrons, *Beam dynamics), Magnetic fields, Orbits, Oscillations.

For abstract, see NSA 28 07, number 16208.

20H. Particle Physics

AAEC/E-277/GA PC$3.75/MF$1.45
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
COMPILATION OF S AND P WAVE NEUTRON STRENGTH FUNCTION DATA.
A. R. de L. Musgrove. Mar 73, 33p
U.S. Sales Only.

Descriptors: (*Heavy nuclei, Neutron reactions), (*Intermediate mass nuclei, Neutron reactions), (*Light nuclei, Neutron reactions), (*Neutron reactions, *Capture), P waves, Resonance, S waves, Strength functions, Tables.

For abstract, see NSA 28 08, number 19893.

AD-768 477/2GA PC$3.50/MF$1.45
Gulf Radiation Technology San Diego Calif
INTEGRAL EXPERIMENT TO TEST CARBON AND NITROGEN CROSS SECTIONS.
Final rept. 23 Aug 71-15 Aug 72,
Larry Harris, Jr., Gerald D. Trimble, and Jack C. Young. 12 Sep 72, 74p Rept no. Gulf-RT-A12292
DNA-2986F
Contract DNA001-72-C-0020

Descriptors: (*Neutron scattering, *Neutron cross sections), (*Gamma-ray cross sections, Tables), (*Nitrogen, Nuclear cross sections), (*Carbon, Nuclear cross sections), Neutron detectors, Curve fitting, Graphics.

An integral experiment, designed to provide high-sensitivity tests for gamma-ray production and neutron-scattering cross sections, has been performed. The experiment is based on the white-source, pulsed-neutron, time-of-flight method with the sample at the detector end of the flight path. Measurements were made with a single 5 x 5 cm cylindrical NE-213 detector positioned at 30, 55, 90, and 125 degrees relative to the incident neutron beam. Pulse-shape discrimination was used to separate neutron and gamma-ray counts. Measured count rates due to secondary gamma rays and scattered neutrons from two sample materials, graphite and liquid nitrogen, are reported here as functions of time and incident neutron energy. Differences between calculated gamma-ray and neutron count rates and those reported here should be readily interpreted in terms of specific cross-section deficiencies at well defined incident neutron energies in the 1.5- to 20-MeV range. (Author)

AD-768 579/5GA Reprint
California Univ Berkeley Dept of Physics
HEAVY PION, MODIFIED PARTIALLY CONSERVED AXIAL-VECTOR CURRENT HYPOTHESIS, AND NEUTRAL PION YIELDS 2 GAMMAS: CLASSIFICATION OF NEW MODELS, INCLUDING GAUGE MODELS,
I. Bars, and M. B. Halpern. 22 Nov 72, 9p AFOSR-TR-73-1840
Contract F44620-70-C-0028
Availability: Pub. in Physical Review D, v7 n10 p3043-3049, 15 May 73.

Descriptors: (*Pions, Nuclear models), Gamma emission, Dispersion relations.
Identifiers: Hadrons, Axial vector current, SU3 theories.

The gauge model of hadrons strongly suggests a heavy pion. Motivated by this, the author classify and discuss general chiral-like models, including a heavy pion. Workable models are discussed with respect to a number of popular theoretical ideas. Particular attention is paid to such topics as Neutral pion yields 2 gammas, the anomaly-free partially conserved axial-vector current relations of the gauge model, and Lagrangian realization of Drell's recent dispersion model. (Author)

AD-768 580/3GA Reprint
California Univ Berkeley Dept of Physics
PROJECTIVE REPRESENTATIONS OF SL(3,C) IN THE Z-OPERATOR FORMALISM,
Itzhak Bars. 6 Dec 72, 13p AFOSR-TR-73-1758
Contract F44620-70-C-0028
Availability: Pub. in Jnl. Mathematics Physics, v14 n6 p759-769 Jun 73.

Descriptors: (*Nuclear models, Theory), Groups(Mathematics), Matrix algebra, Transformations(Mathematics), Hilbert space, Partial differential equations.
Identifiers: SL(3 C) theories, Lorentz groups.

An operator formalism, previously developed to discuss the Gel'fand - Naimark z-basis for the homogeneous Lorentz group, is now generalized to treat the projective representations of SL(3,C). The author found the projective position operators (Z sub 1), (Z sub 2), (Z sub 3), as well as their canonical conjugate momenta which form the building blocks of the generators of SL(3,C). The z-representation, the states in which the 'position' operators (Z sub i) are diagonal, has very simple global transformation properties. This representation also leads to a Hilbert space endowed with an affine metric G, which relates the covariant and contravariant states. All unitary representations are unified by means of a single scalar product in which the matrix elements of G play the role of an intertwining operator. (Modified author abstract)

AD-768 584/5GA Reprint
Yale Univ New Haven Conn Gibbs Lab
MUONIUM. IV. PRECISION MEASUREMENT OF THE MUONIUM HYPERFINE-STRUCTURE INTERVAL AT WEAK AND VERY WEAK MAGNETIC FIELDS,
P. A. Thompson, P. Crane, J. J. Amato, V. W. Hughes, and G. Zu Putlitz. 18 Dec 72, 28p
AFOSR-TR-73-1924
Contract F44620-71-C-0042
See also report dated 28 Dec 71, AD-748 141.
Availability: Pub. in Physical Review A, v8 n1 p86-112 Jul 73.

Descriptors: (*Muons, Hyperfine structure), Magnetic resonance, Microwave spectroscopy, Ground state, Argon, Krypton, Graphics.
Identifiers: *Muonium.

A complete discussion is given of the authors' precision measurement of the hyperfine-structure interval of the ground state of muonium at a weak magnetic field (about 3 G) using the resolved transitions (F,(M sub f))=(1, plus or minus 1)-(0,0), and at a very weak magnetic field (about 10 mG) using unresolved transitions delta F=plus or minus 1). (Modified author abstract)

AD-769 006/8GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
A FUNCTIONAL-ANALYTIC DERIVATION OF CASE'S FULL AND HALF-RANGE FORMULAS,
Edward W. Larsen, and George J. Habetler. Apr 73, 13p
Grant AF-AFOSR-2013-71
Prepared in cooperation with Rensselaer Polytechnic Inst., Troy, N.Y.
Availability: Pub. in Communications on Pure and Applied Mathematics, v26 p525-537 1973.

Descriptors: (*Neutron transport theory, Partial differential equations), Banach space, Theorems.

In 1960, K. M. Case showed how to obtain solutions of the neutron transport equation using singular eigenfunctions. Case considered the simplified plane-symmetric, time-independent, one-speed neutron transport equation with isotropic scattering; other authors generalized his results to account for anisotropic scattering, time-dependence, and multigroup energy-dependence. The application of singular eigenfunctions to initial-boundary value problems has however given rise to the difficulties of proving completeness and solving for the proper expansion coefficients. These difficulties have not yet been overcome. In the paper, the authors present a new method for the derivation of the full and half-range formulas of the neutron transport equation.

AECL-4426/GA PC$4.25/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
COSMIC RAY IGY NEUTRON MONITOR DATA. V. FROM DEEP RIVER, ONTARIO AND MONTHLY GRAPHS (JANUARY 1962--DECEMBER 1962).
J. F. Steljes. May 73, 45p
U.S. Sales Only.

Descriptors: (*Cosmic radiation, *Monitoring), (*Neutrons, Cosmic radiation), Canada, Pressure dependence, Tables.

For abstract, see NSA 28 07, number 16219.

AEEW-M-1191/GA PC$3.00/MF$1.45
Atomic Energy Establishment, Winfrith (England).
MINIGAL OUTPUT FROM UK NUCLEAR DATA LIBRARY: NDL1 (1973) THERMAL CROSS-SECTIONS, RESONANCE INTEGRALS AND FISSION SPECTRUM AVERAGES.
A. L. Pope, and J. S. Story. Apr 73, 20p
U.S. Sales Only.

Descriptors: (*Neutron reactions, *Cross sections), Tables, Thermal neutrons, Fast neutrons, Prompt neutrons, Epithermal neutrons, Ev range, Intermediate neutrons, Kev range, Mev range 01-10, Milli ev range, Resonance integrals.

For abstract, see NSA 28 07, number 16969.

AEEW-M-1200/GA PC$4.00/MF$1.45
Atomic Energy Establishment, Winfrith (England).
LEAP AND ADDELT, A USERS GUIDE TO TWO COMPLEMENTARY CODES ON THE ICL-470 FOR CALCULATING THE SCATTERING LAW FROM A PHONON FREQUENCY FUNCTION.
A. T. D. Butland. Jun 73, 40p
U.S. Sales Only.

Descriptors: (*Neutron transport theory, Computer codes), (*Computer codes, *A codes), (*Thermal neutrons, *Spectra), Icl computers, L codes, Phonons, Scattering.

For abstract, see NSA 28 07, number 17695.

ANU-P-562/GA PC$4.75/MF$1.45
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
ISOBARIC ANALOGUE RESONANCE STUDIES IN SOME RARE-EARTH NUCLEI.
N. H. Merrill, S. Whineray, W. M. Zuk, D. C. Weisser, and C. L. Hollas. 1972, 55p
U.S. Sales Only.

Descriptors: (*Gadolinium 160, *Proton reactions), (*Dysprosium 162, Proton reactions), (*Dysprosium 164, Proton reactions), (*Erbium 166, Proton reactions), Nilsson-mottelson model, Elastic scattering, Erbium 168, Erbium 170, Excitation functions, Mev range 10-100, Ytterbium 174, Coulomb energy, Holmium 163, Holmium 165, Isobaric analogs, Level widths, Lutetium 175, Orbital angular momentum, Protons, Resonance, Spectroscopic factors, Terbium 161, Thulium 167, Thulium 169, Thulium 171.

For abstract, see NSA 28 08, number 19937.

ANU-P-567/GA PC$3.00/MF$1.45
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
ALPHA CAPTURE TO THE EXP 40 CA GIANT QUADRUPOLE RESONANCE.
D. Branford. 1973, 8p
U.S. Sales Only.

Descriptors: (*Calcium 40, *Giant resonance), (*Alpha reactions, *Capture), (*Argon 36, Alpha reactions), Excitation functions, Gamma radiation, Mev range 10-100, Quadrupoles.

For abstract, see NSA 28 08, number 19848.

ANU-P-568/GA PC$3.00/MF$1.45
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
SYMMETRY POTENTIAL FOR TRITONS.
J. Nurzynski. 1971, 7p
U.S. Sales Only.

Descriptors: (*Optical models, *Nuclear potential), (*Triton reactions, *Elastic scattering), Intermediate mass nuclei, Mev range 10-100, Symmetry, Tritons.

For abstract, see NSA 28 08, number 19996.

ANU-P-570/GA PC$3.00/MF$1.45
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
PLACEMENT OF THE 188 KEV TRANSITION IN EXP 70 GA.
L. E. Carlson, M. R. Najam, W. F. Davidson, J. A. Biggerstaff, and P. W. Martin. 1970, 18p
U.S. Sales Only.

Descriptors: (*Gallium 70, *Energy-level transitions), (*Zinc 70, Proton reactions), (*Proton reactions, *Charge-exchange reactions), Energy spectra, Gamma radiation, Gamma spectra, Mev range 01-10, Neutrons, Energy levels, Excited states, Lifetime, Lifetime.

For abstract, see NSA 28 08, number 19881.

ANU-P-571/GA PC$4.00/MF$1.45
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
SPINS OF LEVELS IN EXP 70 GA.
M. R. Najam, L. E. Carlson, W. F. Davidson, and W. M. Zuk. 1973, 38p
U.S. Sales Only.

Descriptors: (*Gallium 70, *Energy levels), (*Proton reactions, *Charge-exchange reactions), (*Zinc 70, Proton reactions), Angular distribution, Compound nucleus reactions, Gamma radiation, Gamma spectra, Mev range 01-10, Neutrons, Statistical models, Branching ratio, Branching ratio, Energy-level transitions, Excited states, Mixing ratio, Multipole radiation, Nuclear structure, Parity, Shell models, Spin, Spin.

For abstract, see NSA 28 08, number 19882.

ANU-P-573/GA PC$3.00/MF$1.45
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
POLARIZATION STUDIES OF GROUND-STATE RADIATION FROM THE 2.21 AND 2.73 MEV LEVELS OF EXP 27 AL.
P. R. Gardner, A. M. Baxter, R. A. I. Bell, L. E. Carlson, and D. C. Kean. 1972, 17p
U.S. Sales Only.

Descriptors: (*Aluminium 27, *Energy-level transitions), (*Proton reactions, *Inelastic scattering), Angular distribution, Asymmetry, Coincidence spectrometry, Gamma radiation, Gamma spectra, Mev range 01-10, Mixing ratio, Polarization.

For abstract, see NSA 28 08, number 19849.

ANU-P-574/GA PC$3.00/MF$1.45
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
1522 KEV TRANSITION IN EXP 28 SI.
L. E. Carlson, D. Branford, F. C. P. Huang, and T. R. Ophel. 1972, 9p
U.S. Sales Only.

Descriptors: (*Silicon 28, *Energy-level transitions), (*Aluminium 27, Proton reactions), (*Proton reactions, *Capture), Angular correlation, Gamma radiation, Mev range 01-10, Excited states, Mixing ratio, Nuclear structure, Resonance.

For abstract, see NSA 28 08, number 19850.

BMFT-FBK-73-2/GA PC$9.50/MF$1.45
Cologne Univ. (West Germany). Institut fuer Kernphysik.
ANNUAL REPORT, 1970/1971.
W. Gruhle. Mar 73, 146p
In German. U.S. Sales Only.

Descriptors: (*Van de graaff accelerators, *Operation), (*Nuclear physics, *Research programs), Channeling, Computer codes, German federal republic, Nuclear reactions, Nuclear structure, On-line systems, Pdp computers, Scattering.

For abstract, see NSA 28 07, number 16970.

BNL-tr-541/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr).
STRUCTURE OF NEUTRON RESONANCES.
V. G. Solov'ev. 1973, 17p CONF-730538-2
Translation by S.J. Amoretty of JINR--P4-7046.

Descriptors: (*Nuclei, *Energy levels), Coupling, Neutrons, Nuclear structure, Phonons, Quasi particles, Resonance.

For abstract, see NSA 28 08, number 19997.

CEA-N-1601/GA PC$10.25/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
REGGE ANALYSES OF THE FORWARD SCATTERING, IN THE REACTIONS 0 EXP - 1/2 EXP + IMPLIES 0 EXP - 1/2 EXP + AT HIGH ENERGY.
A. Derem. Feb 73, 161p
In French. U.S. Sales Only.

Descriptors: (*Kaon-nucleon interactions, *Scattering amplitudes), (*Pion-nucleon interactions, Scattering amplitudes), (*Omega-784 resonances, *Obe model), (*A2-1310 resonances, Obe model), Gev range 01-10, Gev range 10-100, K-1420 resonances, K-892 resonances, Linear momentum, Regge poles, Su-3 groups.

For abstract, see NSA 28 07, number 16715.

CEA-N-1602/GA PC$10.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
STUDY OF PI EXP - P INTERACTIONS FROM 500 TO 765 MEV/C AND PARTIAL WAVE ANALYSIS OF THE PI EXP - P IMPLIES PI EXP - P PI EXP 0 AND PI EXP - P IMPLIES PI EXP - PI EXP + N REACTIONS.
T. D. Nguyen. Apr 73, 158p
In French. U.S. Sales Only.

Descriptors: (*Delta-1236 resonances, *Particle production), (*Eta mesons, Particle production), (*Rho-765 resonances, Particle production), (*Sigma-410 resonances, Particle production), Angular distribution, Branching ratio, Bubble chambers, Cross sections, Decay, Distribution, Inelastic scattering, Isobar model, Linear momentum, Mev range 100-1000, Missing mass, Neutrons, Partial waves, Pion-proton interactions, Pions minus, Pions neutral, Pions plus, Protons, Total cross sections.

For abstract, see NSA 28 08, number 19537.

CEA-N-1609/GA PC$9.75/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
EXPERIMENTAL DETERMINATION OF THE PARAMETERS OF THE K EXP + IMPLIES PI EXP + PI EXP - E EXP + NU DECAY.
A. Zylberstejn. Apr 73, 153p
In French. U.S. Sales Only.

Descriptors: (*Kaons plus, *Leptonic decay), (*Pion-pion interactions, *Scattering lengths), Electron neutrinos, Final-state interactions, Form factors, Mass, Mev range 100-1000, Monte carlo method, Partial waves, Phase shift, Pions minus, Pions plus, Positrons.

For abstract, see NSA 28 07, number 16511.

CEA-N-1610/GA PC$5.75/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
APOLLO: A MULTIGROUP CODE FOR THE SOLUTION OF THE TRANSPORT EQUATION FOR THERMAL AND FAST NEUTRONS.
A. Hoffmann, F. Jeanpierre, A. Kavenoky, M. Livolant, and H. Lorain. Mar 73, 72p
In French. U.S. Sales Only.

Descriptors: (*Computer codes, *A codes), (*Thermal neutrons, *Neutron flux), (*Fast neutrons, Neutron flux), Adjoint flux, Anisotropy, Cross sections, Cylindrical configuration, Fission products, Heavy nuclei, Material buckling, Multigroup theory, Neutron slowing-down theory, One-dimensional calculations, Reactor cells, Resonance, Self-shielding, Spherical configuration.

For abstract, see NSA 28 07, number 16834.

CEA-N-1611/GA PC$8.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
STUDY OF 0 EXP - 1/2 EXP + FINAL STATES PRODUCED BY K EXP - --PROTON SCATTERING AT 3.95 GEV/C.
L. Moscoso. Mar 73, 120p
In French. U.S. Sales Only.

Descriptors: (*Kaon-proton interactions, *Final-state interactions), Angular distribution, Antikaons neutral, Baryon-exchange models, Bubble chambers, Decay, Differential cross sections, Distribution, Eta mesons, Exchange degeneracy, Gev range 01-10, Hyperons, Kaons minus, Lambda particles, Missing mass, Neutrons, Particle production, Pions minus, Pions neutral, Pions plus, Polarization, Quarks, Regge poles, Regge trajectories, Scattering, Sigma minus, Sigma plus, Spin orientation, Su-6 groups, Vector dominance model.

For abstract, see NSA 28 08, number 19538.

CEA-R-4428/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
STUDY OF THE DECAY OF EXP 137 CS + /SUP 137M/BA.
J. Legrand, J. P. Brethon, and F. Lagoutine. Jul 73, 15p
In French. U.S. Sales Only.

Descriptors: (*Barium 137, *Isomeric transitions), (*Cesium 137, *Beta-minus decay), Half-life, Internal conversion, K conversion, Branching ratio.

For abstract, see NSA 28 08, number 19897.

CEA-R-4441/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
COSMIC RAY FORMATION OF ALUMINIUM 26.
J. Tobailem, C. H. de Lassus St-Geinies, and H. Reeves. Jun 73, 15p
In French. U.S. Sales Only.

Descriptors: (*Aluminium 26, *Abundance), (*Primary cosmic radiation, *Nuclear reactions), (*Solar radiation, Nuclear reactions), (*Meteorites, Nuclear reactions), Aluminium, Cosmic gases, Interstellar space, Iron, Magnesium, Physical radiation effects, Proton reactions, Silicon.

For abstract, see NSA 28 07, number 16220.

CERN-HERA-73-1/GA PC$7.75/MF$1.45
European Organization for Nuclear Research, Geneva (Switzerland).
COMPILATION OF CROSS SECTIONS. III. P AND ANTI P INDUCED REACTIONS.
E. Bracci, J. P. Droulez, E. Flaminio, J. D. Hansen, and D. R. O. Morrison. 7 May 73, 114p
U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Cross sections), (*Proton-neutron interactions, Cross sections), (*Proton-deuteron interactions, Cross sections), (*Proton-antiproton interactions, Cross sections), Antiproton-deuteron interactions, Antiproton-neutron interactions, Linear momentum, Tables.

For abstract, see NSA 28 07, number 16523.

CNRS-CPT-73-P-516/GA PC$3.00/MF$1.45
Centre National de la Recherche Scientifique, Marseilles (France). Centre de Physique Theorique.
FOURTH-ORDER VACUUM POLARIZATION CORRECTION TO THE POSITRONIUM HYPERFINE STRUCTURE.
D. A. Owen. Jan 73, 5p
U.S. Sales Only.

Descriptors: (*Positronium, *Hyperfine structure), Annihilation, Corrections, Diagrams, Feynman diagram, Ground states, Vacuum polarization.

For abstract, see NSA 28 08, number 19443.

CNRS-CPT-73-P-517/GA PC$3.00/MF$1.45
Centre National de la Recherche Scientifique, Marseilles (France). Centre de Physique Theorique.
COMPOSITION OF COHERENT SPIN STATES.
J. Bellissard, and R. Holtz. Jan 73, 6p
U.S. Sales Only.

Descriptors: (*Su-2 groups, *Clebsch-gordan coefficients), Bosons, Energy levels, Spin.

For abstract, see NSA 28 07, number 16767.

CNRS-CPT-73-P-521/GA PC$3.00/MF$1.45
Centre National de la Recherche Scientifique, Marseilles (France). Centre de Physique Theorique.
ABOUT THE NONRELATIVISTIC STRUCTURE OF THE CONFORMAL ALGEBRA.
G. Burdet, M. Perrin, and P. Sorba. Feb 73, 9p
U.S. Sales Only.

Descriptors: (*Conformal groups, *Algebra), (*Hadrons, *Quark model), Group theory, Invariance principles, Minkowski space, Quantum electrodynamics, Schroedinger equation, So groups.

For abstract, see NSA 28 08, number 19707.

COO-1428-318/GA PC$3.00/MF$1.45
Purdue Univ., Lafayette, Ind. Dept. Of Physics. Indiana-Purdue Univ., Indianapolis. Dept. Of Physics.
ZEROS OF THE VECTOR MESON PRODUCTION AMPLITUDE AND THEIR IMPLICATIONS.
L. J. Gutay, R. L. McIlwain, K. V. Vasavada, and F. T. Meiere. 1972, 11p

Descriptors: (*Rho-765 resonances, *Particle production), (*K*resonances, Particle production), (*Pions, Particle production), Absorption, Density matrix, Helicity, Matrix elements, Orbital angular momentum, Parity, Scattering amplitudes, Vector mesons.

For abstract, see NSA 28 08, number 19652.

COO-1428-320/GA PC$3.25/MF$1.45
Purdue Univ., Lafayette, Ind. Dept. Of Physics.
ANNUAL PROGRESS REPORT, TASK B, FOR JUNE 1, 1972--MAY 31, 1973.
1973, 25p
Contract AT(11-1)-1428

Descriptors: (*High energy physics, *Research programs).

For abstract, see NSA 28 07, number 16573.

COO-1428-321/GA PC$3.75/MF$1.45
Purdue Univ., Lafayette, Ind.
ANNUAL PROGRESS REPORT, TASK A, FOR JUNE 1, 1972--MAY 31, 1973.
F. J. Loeffler. 1973, 34p
Contract AT(11-1)-1428

Descriptors: (*Hadron-hadron interactions, *Research programs), Hadrons.

For abstract, see NSA 28 07, number 16541.

COO-1428-323/GA PC$7.25/MF$1.45
Purdue Univ., Lafayette, Ind. Dept. Of Physics.
ANNUAL REPORT, TASK C, FOR OCTOBER 1, 1972--SEPTEMBER 30, 1973.
E. C. Fowler. 1973, 102p
Contract AT(11-1)-1428

Descriptors: (*High energy physics, *Research programs), (*Nuclear physics, Research programs), Argon 37, Baryon resonances, Chlorine 37, Electron neutrinos, Electrons, Indiana, Leptons, Meetings, Muons, Neutrino beams, Neutrino reactions, Nuclear reactions, Particle models, Pion beams, Pion-proton interactions, Pions plus, Protons, Quarks, Strong interactions.

For abstract, see NSA 28 08, number 19617.

COO-1545-125/GA PC$3.00/MF$1.45
Oregon Univ., Eugene. Inst. Of Theoretical Science. Ohio State Univ., Columbus. Dept. Of Physics.
GENERATING FUNCTIONS AND KNO SCALING MODELS.
G. J. II Aubrecht, K. Tanaka, and R. Torgerson. 1973, 15p
Contract AT(11-1)-1545

Descriptors: (*Proton-proton interactions, *Scale invariance), (*Protons, *Proton beams), Boundary conditions, Charged particles, Correlation functions, Coupling constants, Cross sections, Elastic scattering, Functions, Inelastic scattering, Multiplicity, Particle production, Parton model, Regge poles, Topology.

For abstract, see NSA 28 07, number 16746.

COO-1545-126/GA PC$3.00/MF$1.45
Ohio State Univ., Columbus. Dept. Of Physics.
WHAT CAN WE MEASURE IN RHO-- OMEGA INTERFERENCE EXPERIMENTS.
A. Rabl, and N. W. Reay. 1972, 10p
Contract AT(11-1)-1545

Descriptors: (*Rho-765 resonances, *Interference), (*Omega-784 resonances, Interference), Final-state interactions, Isospin, Particle production, Pions, Scattering amplitudes.

For abstract, see NSA 28 08, number 19653.

COO-1545-127/GA PC$3.75/MF$1.45
Ohio State Univ., Columbus.
HIGH ENERGY PHYSICS STUDIES. PROGRESS REPORT PART I. EXPERIMENTAL PROGRAM.
1973, 32p
Contract AT(11-1)-1545

Descriptors: (*Hadron-hadron interactions, *Research programs), Hadrons.

For abstract, see NSA 28 07, number 16524.

COO-1717-6/GA PC$4.25/MF$1.45
Ohio Univ., Athens (Usa). John E. Edwards Accelerator Lab.
DIFFERENTIAL CROSS SECTION AND POLARIZATION FOR 2.63-MEV NEUTRONS SCATTERED FROM EXP 12 C.
H. D. Knox, J. M. Cox, R. W. Finlay, and R. O. Lane. 2 Jul 73, 43p
Contract AT(11-1)-1717

Descriptors: (*Carbon 12, Neutron reactions), (*Neutron reactions, *Elastic scattering), (*Neutron beams, Elastic scattering), Differential cross sections, Mev range 01-10, Polarization.

For abstract, see NSA 28 08, number 19823.

COO-1764-179/GA PC$4.00/MF$1.45
Minnesota Univ., Minneapolis. School of Physics and Astronomy.
FORMULATION OF BETHE--SALPETER EQUATION IN E--P DEEP INELASTIC SCATTERING.
W. Y. Lau. 1972, 37p
Contract AT(11-1)-1764

Descriptors: (*Electron-proton interactions, *Scattering amplitudes), (*Bethe-salpeter equation, Electron-proton interactions), (*Protons, *Electron beams), Boundary conditions, Coupling, Diagrams, Inelastic scattering, Ladder approximation, Linear momentum, Perturbation theory, Photons, Protons, Pseudoscalar mesons, Scale invariance, Structure functions, Tensors, Virtual particles.

For abstract, see NSA 28 07, number 16589.

COO-2114-7/GA PC$3.00/MF$1.45
Colorado Univ., Boulder. Dept. Of Physics and Astrophysics.
ELEMENTARY PARTICLE AND HIGH ENERGY PHENOMENA. PROGRESS REPORT, SEPTEMBER 1, 1972--SEPTEMBER 1, 1973.
U. Nauenberg, and D. Bartlett. 1973, 13p
Contract AT(11-1)-2114

Descriptors: (*Kaons, *Decay), (*Electromagnetic interactions, *Research programs).

For abstract, see NSA 28 07, number 16512.

COO-2232-7-Ex/GA PC$4.00/MF$1.45
Harvard Univ., Cambridge, Mass.

MEASUREMENT OF PHOTOPRODUCTION OF OMEGA EXP 0 AND RHO EXP 0 MESONS IN HYDROGEN.
G. E. Gladding, J. J. Russell, M. J. Tannenbaum, J. M. Weiss, and G. B. Thomson. 1972, 38p CONF-720923-14
Contract AT(30-1)-2752

Descriptors: (*Rho-765 resonances, *Decay), (*Omega-784 resonances, *Photoproduction), Angular distribution, Density matrix, Differential cross sections, Distribution, Gev range 01-10, Helicity, Linear momentum, Missing mass, Photon beams, Photon-proton interactions, Protons, Spectra.

For abstract, see NSA 28 07, number 16542.

COO-3001-42/GA PC$3.00/MF$1.45
State Univ. Of New York, Stony Brook.
NUCLEON--NUCLEON INTERACTION AND THE INTERACTION OF NUCLEONS WITH ISOBARS.
G. E. Brown. 1973, 17p CONF-730642-1
Contract AT(11-1)-3001

Descriptors: (*Neutrons, *Proton beams), (*Protons, *Antiproton beams), (*N*resonances, *Interactions), Boson-exchange models, Corrections, Delta-1236 resonances, Deuterons, Magnetic moments, N*resonances, Obe model, Omega-784 resonances, Ope model, Particle production, Phase shift, Photons, Pion beams, Pion-pion interactions, Pion-proton interactions, Pions, Proton-antiproton interactions, Proton-neutron interactions, Virtual particles.

For abstract, see NSA 28 08, number 19682.

COO-3065-44/GA PC$3.00/MF$1.45
Rochester Univ., N. Y. Dept. Of Physics and Astronomy.
PROTON--PROTON COLLISIONS AT 102 GEV/C.
P. Slattery. Apr 73, 14p CONF-730320-3
Contract AT(11-1)-3065

Descriptors: (*Proton-proton interactions, *Inclusive interactions), (*Protons, *Proton beams), Bubble chambers, Cross sections, Distribution, Energy spectra, Gev range 100-1000, Linear momentum, Particle production, Pions minus, Pions plus.

For abstract, see NSA 28 08, number 19525.

COO-3071-25/GA PC$3.00/MF$1.45
Pennsylvania Univ., Philadelphia. Dept. Of Physics.
EARLY OBSERVATION OF NEUTRINO AND ANTINEUTRINO EVENTS AT HIGH ENERGIES.
A. Benvenuti, D. Cheng, D. Cline, W. T. Ford, and R. Imlay. 16 Apr 73, 8p

Descriptors: (*Neutrino-proton interactions, *Inclusive interactions), (*Neutrino-neutron interactions, Inclusive interactions), (*Protons, *Antineutrino beams), Antineutrinos, Cross sections, Distribution, Gev range 10-100, Muons minus, Muons plus, Neutrino beams, Particle production, Total cross sections.

For abstract, see NSA 28 07, number 16513.

COO-3080-2/GA PC$3.00/MF$1.45
State Univ. Of New York, Stony Brook. Dept. Of Earth and Space Sciences.
HIGH ENERGY NUCLEAR INTERACTIONS WITH MATTER AND NUCLEAR PROCESSES IN NATURE. ANNUAL REPORT, JULY 1, 1972--JUNE 30, 1973.
O. A. Schaeffer. 1973, 14p
Contract AT(11-1)-3080

Descriptors: (*Proton beams, *Nuclear reactions), (*Uranium, *Proton reactions), (*Vanadium, Proton reactions), Abundance, Age estimation, Argon 39, Chemical composition, Chlorine 36, Cross sections, Meteorites, Performance, Proportional counters.

For abstract, see NSA 28 07, number 16221.

COO-3130-TA-286/GA PC$3.00/MF$1.45
Brown Univ., Providence, R. I. Dept. Of Physics.
HIGH-ENERGY MULTIPARTICLE MODELS.
K. Kang. 1973, 16p CONF-730337-1
Contract AT(11-1)-3130

Descriptors: (*Diffraction models, *Multiple production), (*Multiperipheral model, Multiple production), (*Dual resonance model, Multiple production), (*Fireball model, Multiple production), Correlation functions, Hadron-hadron interactions, Hadrons, Interaction range, Multiplicity, Particle models, Regge poles, Scale invariance, Total cross sections.

For abstract, see NSA 28 07, number 16670.

COO-3130-TA-288/GA PC$3.00/MF$1.45
Brown Univ., Providence, R. I. Dept. Of Physics.
PROGRESS REPORT FOR A RESEARCH PROGRAM IN THEORETICAL HIGH-ENERGY PHYSICS.
D. Feldman. 1 Jun 73, 10p
Contract AT(11-1)-3130

Descriptors: (*High energy physics, *Research programs).

For abstract, see NSA 28 07, number 16574.

COO-3235-24/GA PC$3.00/MF$1.45
Brown Univ., Providence, R. I. Dept. Of Physics.
ISOSPIN IN THE GIANT RESONANCE.
S. Fallieros. 1973, 6p CONF-730301-10
Contract AT(11-1)-3235

Descriptors: (*Photonuclear reactions, Giant resonance), (*Giant resonance, *Isospin), Energy, Excitation, Strength functions.

For abstract, see NSA 28 07, number 17067.

COO-3239-6/GA PC$3.25/MF$1.45
Carnegie-Mellon Univ., Pittsburgh, PA. Dept. Of Chemistry.
NUCLEAR CHEMISTRY RESEARCH OF HIGH ENERGY NUCLEAR REACTIONS AT CARNEGIE--MELLON UNIVERSITY. ANNUAL PROGRESS REPORT, 1972--1973.
A. A. Jr. Caretto. Jun 73, 23p
Contract AT(11-1)-3239

Descriptors: (*Nuclear reactions, *Research programs), Gev range 100-1000, Heavy ion reactions, Heavy ions, Ion beams, Mev range, Pennsylvania, Pion beams, Pion reactions.

For abstract, see NSA 28 08, number 19898.

COO-3274-8/GA PC$3.50/MF$1.45
Johns Hopkins Univ., Baltimore, MD.
NUCLEAR MOMENTS AND NUCLEAR STRUCTURE. ANNUAL PROGRESS REPORT, JANUARY 1, 1973--MAY 31, 1973.
L. Madansky, and Y. K. Lee. 1973, 29p
Contract AT(11-1)-3274

Descriptors: (*Nuclear electric moments, *Research programs), (*Nuclear structure, Research programs), (*Flow counters, *Performance), (*Proportional counters, Performance), Coulomb excitation.

For abstract, see NSA 28 08, number 19824.

COO-3496-29/GA PC$7.50/MF$1.45
Rochester Univ., N. Y. Dept. Of Chemistry.
STUDIES OF NUCLEAR FISSION, LOW-ENERGY NUCLEAR REACTIONS AND TRANSURANIC NUCLEI. PROGRESS REPORT, JUNE 1, 1972--JUNE 1, 1973.
J. R. Huizenga. 1973, 109p
Contract AT(11-1)-3496

Descriptors: (*Heavy ion reactions, *Research programs), (*Fission, Research programs), (*Compound nucleus reactions, Research programs), (*Direct reactions, Research programs), Compound nuclei, Deformed nuclei, Evaporation model, Heavy ions, Heavy nuclei, Ion beams, New york, Nuclear reactions.

For abstract, see NSA 28 08, number 19959.

DESY-73/13/GA PC$4.25/MF$1.45
Deutsches Elektronen-Synchrotron, Hamburg (West Germany).
HOW TO ANALYSE VECTOR MESON PRODUCTION IN INELASTIC LEPTON SCATTERING.
K. Schilling, and G. Wolf. Apr 73, 41p
U.S. Sales Only.

Descriptors: (*Lepton-nucleon interactions, Vector mesons), (*Vector mesons, *Particle production), Angular distribution, Conservation laws, Coordinates, Corrections, Cross sections, Decay, Density matrix, Effective mass, Energy, Exchange interactions, Final-state interactions, Helicity, Hermitian matrix, Inelastic scattering, Linear momentum, Lorentz transformations, Mass, Mathematical space, Matrices, Parity, Parity, Photons, Polarization, Rotation, Scattering amplitudes, Spin, Symmetry, Tensors, Vectors, Virtual particles.

For abstract, see NSA 28 07, number 16649.

DESY-73/14/GA PC$4.00/MF$1.45
Deutsches Elektronen-Synchrotron, Hamburg (West Germany).
RENORMALIZATION AND DEEP INELASTIC LEPTON--NUCLEON SCATTERING.
F. Gutbrod, and U. E. Schroeder. May 73, 40p
U.S. Sales Only.

Descriptors: (*Electroproduction, *Renormalization), (*Electron-nucleon interactions, Parton model), (*Parton model, Renormalization), Absorption, Absorption, Bethe-salpeter equation, Boundary conditions, Coupling, Cross sections, Diagrams, Diagrams, Electric charges, Feynman diagram, Field theories, Final-state interactions, Form factors, Gluon model, Hadrons, Inelastic scattering, Linear momentum, Mass, Matrix elements, Multiperipheral model, Nucleons, Perturbation theory, Phase space, Photons, Propagator, S matrix, Scale invariance, Scattering amplitudes, Singularity, Spectral functions, Spin, Structure functions, Tensors, Virtual particles, Ward identity.

For abstract, see NSA 28 08, number 19564.

EANDC(E)-157-U(Vol.1)/GA PC$8.50/MF$1.45
European-American Nuclear Data Committee.
PROGRESS REPORT ON NUCLEAR DATA RESEARCH IN THE EUROPEAN COMMUNITY FOR THE PERIOD JANUARY 1--DECEMBER 31, 1972.
Mar 73, 128p
U.S. Sales Only.

Descriptors: (*Nuclear physics, *Research programs), Data, Europe.

For abstract, see NSA 28 08, number 19967.

EURFNR-1097/GA PC$3.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Angewandte Kernphysik.

TOTAL NEUTRON CROSS SECTION OF BORON 10 BETWEEN 90 AND 420 KEV.
R. R. Spencer, H. Beer, and F. H. Froehner. Jan 73, 9p KFK-1518, EANDC(E)-147(AL)
U.S. Sales Only.

Descriptors: (*Boron 10, Neutron reactions), (*Neutron reactions, *Total cross sections), Excitation functions, Fast neutrons, Kev range 10-100, Kev range 100-1000.

For abstract, see NSA 28 08, number 19826.

FRNC-TH-290/GA PC$5.45/MF$1.45
Paris Univ. (France).
DETERMINATION OF THE MULTIPLE SCATTERING OF PARTICLES HAVING TRAJECTORIES INCLINED IN RELATION TO THE PLANE OF THE EMULSION.
C. Haudecoeur-Meton. 1971, 79p
In French.

Descriptors: (*Proton reactions, *Multiple scattering), (*Neutron reactions, Multiple scattering), Angular distribution, Annihilation, Antineutrons, Antiprotons, Deformation, Gev range 01-10, Mev range 100-1000, Neutrons, Nuclear emulsions, Particle tracks, Polynomials, Protons, Signals, Trajectories.

For abstract, see NSA 28 07, number 16525.

FRNC-TH-353/GA PC$5.45/MF$1.45
Paris Univ. (France).
UTILIZATION OF RANDOM MATRICES TO CALCULATE THE DENSITY OF THE LEVELS OF NUCLEAR SYSTEMS.
A. Gervois. 1972, 117p
In French. U.S. Sales Only.

Descriptors: (*Nuclei, *Energy levels), (*Statistical models, *Hamiltonians), Gauss function, Matrices, Nuclear models.

For abstract, see NSA 28 08, number 19999.

FRNC-TH-356/GA PC$8.25/MF$1.45
Grenoble Univ. (France).
STUDY OF CERTAIN DYSPROSIUM AND HOLMIUM NUCLEI USING ON-LINE SPECTROSCOPY.
J. Boutet. 1973, 122p
In French. U.S. Sales Only.

Descriptors: Alpha reactions, Compound nucleus reactions, Dysprosium 159, Gadolinium 158, Gamma radiation, Gamma spectra, Mev range 10-100, Neutrons, Dysprosium 157, Gadolinium 155, Gadolinium 156, Proton reactions, Terbium 159, Electron capture decay, Electrons, Ft value, Holmium 159, Internal conversion, Spectra.

For abstract, see NSA 28 07, number 17009.

FRNC-TH-360/GA PC$8.75/MF$1.45
Strasbourg Univ. (France).
STUDY OF THE CHANNELS OF THE ANTI PD IMPLIES P/SUB S/ANTI PP PI EXP - AND ANTI PD IMPLIES P/SUB S/ANTI PP PI EXP - PI EXP 0 REACTIONS AT 5.5 GEV/C.
A. Michalon. 1972, 132p
In French. U.S. Sales Only.

Descriptors: (*N*resonances, *Decay), (*Delta-1236 resonances, *Particle production), Antibaryons, Antiproton-deuteron interactions, Antiproton-neutron interactions, Antiprotons, Cross sections, Effective mass, Final-state interactions, Gev range 01-10, Gev range 01-10, Impulse approximation, Linear momentum, Pions minus, Pions neutral, Protons, Regge poles.

For abstract, see NSA 28 08, number 19526.

FRNC-TH-374/GA PC$6.25/MF$1.45
Paris Univ., Orsay (France).
STUDY OF PI - EXP 12 C ELASTIC SCATTERING AT MEDIUM ENERGIES USING THE OPTICAL MODEL.
J. P. Maillet. 1972, 83p
In French. U.S. Sales Only.

Descriptors: (*Pion reactions, *Elastic scattering), (*Carbon 12, Pion reactions), Coherent scattering, Corrections, Cross sections, Differential cross sections, Impulse approximation, Linear momentum transfer, Mev range 10-100, Mev range 100-1000, Multiple scattering, Optical models, Pions minus, Potential scattering, Two-body problem.

For abstract, see NSA 28 08, number 19827.

FRNC-TH-378/GA PC$5.25/MF$1.45
Paris Univ., Orsay (France).
OPTICAL ANALYSIS OF THE ELASTIC SCATTERING OF EXP 6 LI ON EXP 11 B, EXP 12 C, AND EXP 13 C AT 28 MEV.
B. M. Traore. 1972, 63p
In French. U.S. Sales Only.

Descriptors: (*Lithium 6 reactions, *Elastic scattering), (*Boron 11, Lithium 6 reactions), (*Carbon 12, Lithium 6 reactions), (*Carbon 13, Lithium 6 reactions), Angular distribution, Coulomb field, Cross sections, Dwba, Hauser-feshbach theory, Least square fit, Mev range 10-100, Nuclear potential, Nuclear reactions, Optical models.

For abstract, see NSA 28 08, number 19828.

INDC(CCP)-32-U/GA PC$3.50/MF$1.45
International Nuclear Data Committee.
NUCLEAR PHYSICS RESEARCH IN THE USSR. COLLECTED ABSTRACTS, ISSUE 13.
Apr 73, 26p
U.S. Sales Only.

Descriptors: (*Nuclear physics, *Ussr).

For abstract, see NSA 28 07, number 17044.

INP-824/GA PC$3.75/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
RESONANT STRUCTURES IN THE ELASTIC SCATTERING OF ALPHA PARTICLES ON LIGHT AND MEDIUM WEIGHT NUCLEI.
A. Budzanowski, K. Chyla, R. Czabanski, K. Grotowski, and L. Jarczyk. Dec 72, 32p
U.S. Sales Only.

Descriptors: (*Alpha reactions, *Elastic scattering), (*Oxygen, Alpha reactions), (*Magnesium, Alpha reactions), (*Aluminium 27, Alpha reactions), Angular distribution, Calcium, Cobalt, Copper, Correlations, Differential cross sections, Energy, Excitation functions, Gold, Mev range 10-100, Nickel, Resonance, Silicon.

For abstract, see NSA 28 07, number 16865.

INR-1410/GA PC$16.25/MF$1.45
Institute of Nuclear Research, Warsaw (Poland).
INSTITUTE OF NUCLEAR RESEARCH TWO-YEAR-BOOK, 1970--1971.
1972, 283p
U.S. Sales Only.

Descriptors: (*Nuclear physics, *Research programs), (*High energy physics, Research programs), (*Radiation chemistry, Research programs), (*Radiochemistry, Research programs), Energy levels, Fission, High temperature, Magnetohydrodynamics, Nuclear fuels, Nuclear reactions, Plasma, Qualitative chemical analysis, Radiation protection, Radioisotopes, Radiometric gages, Reactors.

For abstract, see NSA 28 08, number 19902.

INR-1457/GA PC$5.50/MF$1.45
Institute of Nuclear Research, Warsaw (Poland).
GIER-ALGOL 4 PROGRAM FOR THE STATISTICAL MODEL CALCULATIONS OF THE MULTISTAGE NUCLEAR REACTIONS.
W. Grochulski, and A. Marcinkowski. 1973, 68p
U.S. Sales Only.

Descriptors: (*Computer codes, *I codes), (*Nucleon reactions, *Cross sections), Algol, Energy spectra, Statistical models.

For abstract, see NSA 28 08, number 20001.

INR-1458/GA PC$3.00/MF$1.45
Institute of Nuclear Research, Warsaw (Poland).
STUDY OF THE EXP 115 IN(P, ALPHA) EXP 112 CD REACTION AT PROTON ENERGY 14 MEV.
I. M. Turkiewicz. 1973, 10p
U.S. Sales Only.

Descriptors: (*Indium 115, Proton reactions), (*Proton reactions, *Pickup reactions), (*Carbon 12, *Energy-level transitions), Alpha spectra, Ground states, Mev range 10-100, Q-value.

For abstract, see NSA 28 07, number 16978.

INS-593/GA PC$7.50/MF$1.45
Institute of Nuclear Sciences, Lower Hutt (New Zealand).
REPORT ON THE WORK OF THE INSTITUTE OF NUCLEAR SCIENCES. PROGRESS REPORT 20, JULY--DECEMBER 1972.
T. A. Rafter. Feb 73, 109p
U.S. Sales Only.

Descriptors: (*Nuclear physics, *Research programs), (*Radiation chemistry, Research programs), (*Geochemistry, Research programs), (*Age estimation, Research programs), Fallout, Radioisotopes, Uses.

For abstract, see NSA 28 08, number 19867.

IPNO/HE-73-2/GA PC$3.25/MF$1.45
Paris Univ., Orsay (France). Institut de Physique Nucleaire.
MEASUREMENT OF THE POLARIZATION PARAMETER IN PI EXP - P BACKWARD ELASTIC SCATTERING AT 6 GEV/C.
L. Dick, Z. Janout, H. Aoi, C. Caverzasio, and A. Gonidec. Feb 73, 21p
U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Polarization), Boundary conditions, Cross sections, Elastic scattering, Gev range 01-10, Isospin, Linear momentum, Linear momentum transfer, Particle models, Pions minus, Polarized targets, Protons, Spin orientation.

For abstract, see NSA 28 07, number 16543.

JAERI-M-4760/GA PC$4.00/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
SENSITIVITY COEFFICIENT OF INTEGRAL DATA AND GENERALIZED PERTURBATION METHOD.
H. Mitani, and H. Kuroi. Mar 72, 39p
In Japanese. U.S. Sales Only.

Descriptors: (*Neutrons, *Corrections), (*Cross sections, Corrections), Adjoint flux, Disturbances, Errors, Fission ratio, Integral equations, Multiplication factors, Neutron importance function, Perturbation theory, Reaction kinetics, Sensitivity, Tables.

For abstract, see NSA 28 07, number 17554.

JAERI-M-4930/GA PC$5.45/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
GAMMA-RAY SPECTRA OF THE FPS (FPDATA-2).
N. Sasamoto, and K. Tasaka. Aug 72, 77p
U.S. Sales Only.

Descriptors: (*Fission products, *Gamma spectra), Fission yield, Gamma radiation, Half-life, Time dependence.

For abstract, see NSA 28 08, number 19903.

JAERI-M-5033/GA PC$4.00/MF$1.45
Japan Atomic Energy Research Inst., Tokyo.
ENERGY DISTRIBUTIONS OF NEUTRONS SCATTERED FROM KHF SUB 2 , (NH SUB 4) SUB 2 SO SUB 4 , AND POLYETHYLENE BY NEUTRON ENERGY-LOSS METHOD.
M. Sakamoto, M. Iizumi, and H. Motohashi. Oct 72, 14p
U.S. Sales Only.

Descriptors: (*Neutron transport, *Neutron spectra), (*Potassium fluorides, Neutron transport), (*Ammonium compounds, Neutron transport), (*Polyethylenes, Neutron transport), Ammonium compounds, Distribution, Energy spectra, Energy transfer, Hydrogen compounds, Motion, Sulfates.

For abstract, see NSA 28 07, number 16836.

JINR-E1-7163/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
PROBABILITY OF QUASI-TWO-BODY TRANSITIONS AT HIGH ENERGIES.
V. S. Stavinskii. 1973, 8p
U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Cross sections), (*N-1520 resonances, *Particle production), (*N*resonances, Particle production), (*N-1470 resonances, Particle production), Energy, Final-state interactions, Matrix elements, Mesons, N-1688 resonances, Neutrons, Pions minus, Pions plus, Probability, Protons, Resonance particles, Statistics.

For abstract, see NSA 28 07, number 16750.

JINR-E1-7207/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
DEUTERON FORM FACTOR FROM EXPERIMENTAL DATA ON THE P--D ELASTIC SCATTERING AT SMALL ANGLES.
V. A. Nikitin, M. G. Shafranova, 1973, 12p
U.S. Sales Only.

Descriptors: (*Proton-deuteron interactions, *Elastic scattering), (*Deuterons, *Form factors), (*Proton-proton interactions, Elastic scattering), (*Proton-neutron interactions, Elastic scattering), Differential cross sections, Distribution, Gev range 10-100, Glauber theory, Nuclear matter.

For abstract, see NSA 28 07, number 16529.

JINR-E1-7215/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
SLOPE PARAMETER AND THE REAL PART OF THE P--N ELASTIC SCATTERING AMPLITUDE IN THE ENERGY RANGE OF 10 TO 70 GEV.
G. G. Beznogikh, A. Buyak, N. K. Zhidkov, V. I. Zayachki, and L. S. Zolin. 1973, 12p
U.S. Sales Only.

Descriptors: (*Proton-neutron interactions, *Scattering amplitudes), Coulomb scattering, Differential cross sections, Dispersion relations, Elastic scattering, Electromagnetic form factors, Energy, Gev range 10-100, Glauber theory, Nucleons, Particle radii, Phase shift, Pomeranchuk particles, Protons, Regge poles, Regge trajectories.

For abstract, see NSA 28 07, number 16751.

JINR-E2-7159/GA PC$3.75/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
SPIN STRUCTURE OF THE INTERACTION OF TWO RELATIVISTIC PARTICLES IN ONE-MESON EXCHANGE MODEL.
N. B. Skachkov. 1973, 35p
U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Scattering amplitudes), (*Rho-765 resonances, *Particle production), (*Obe model, Pion-proton interactions), Born approximation, Euclidean space, Feynman diagram, Geometry, Lobachevsky geometry, Lorentz transformations, Matrix elements, Pions plus, Polarization, Quantum mechanics, Relativistic range, Rotation, Spin, Vectors.

For abstract, see NSA 28 07, number 16725.

JINR-P1-7217/GA PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
CROSS SECTIONS OF INELASTIC INTERACTIONS OF 17 GEV/C ALPHA -PARTICLES WITH (C,O) AND (AG,BR) NUCLEI.
Kh. M. Abdo, N. Dalkhazhav, D. A. Salomov, E. Silesh, and G. Ya. Sun Tsin Yan. 1973, 11p
In Russian. U.S. Sales Only.

Descriptors: (*Alpha reactions, *Inelastic scattering), (*Carbon, Alpha reactions), (*Oxygen, Alpha reactions), (*Silver, Alpha reactions), Bromine, Gev range 10-100, Linear momentum, Probability, Relativity theory, Spallation, Total cross sections.

For abstract, see NSA 28 07, number 16866.

JINR-P2-7096/GA PC$3.25/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
POSSIBILITY OF MEASURING THE ELECTROMAGNETIC FORM FACTORS F/SUB PI /(M EXP 2) AND F SUB 1 /SUP V/(M EXP 2) IN REACTIONS OF THE PI EXP - + P IMPLIES E EXP + + E EXP - + N TYPE.
A. M. Baldin, and V. A. Suleimanov. 1973, 23p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Electromagnetic form factors), Baryon-exchange models, Density matrix, Electrons, Electroproduction, Interference, Isovectors, Matrix elements, Neutrons, Omega-784 resonances, Ope model, Pair production, Photons, Pions, Pions minus, Positrons, Rho-765 resonances, Virtual particles.

For abstract, see NSA 28 07, number 16593.

JINR-P2-7219/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
DUAL DIAGRAMS WITH ONE CLOSED LOOP.
Kh. D. Popov, and D. Ts. Stoyanov. 1973, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Scattering, *Duality), Diagrams, Elementary particles, Excited states, Oscillators, Veneziano model.

For abstract, see NSA 28 07, number 16672.

JINR-P2-7234/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
NECESSITY OF POLARIZATION EXPERIMENTS ON INTERSECTING P--P AND ANTI P--P BEAMS.
B. Z. Kopeliovich, and L. I. Lapidus. 1973, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Proton-antiproton interactions, *Polarization), (*Proton-proton interactions, Polarization), Colliding beams, Correlations, Cross sections, Elastic scattering, Electromagnetic interactions, Interference, Linear momentum, Magnetic moments, Scattering amplitudes, Spin, Tensors, Total cross sections.

For abstract, see NSA 28 07, number 16752.

KFK-EXT-3/72-10/GA PC$6.75/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Experimentelle Kernphysik.
PARTICLE PRODUCTION IN THE FRAMEWORK OF THE NUCLEAR CASCADE MODEL.
H. Schneider. Jan 73, 93p
In German. U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Nuclear cascades), (*Beryllium 9, *Proton reactions), (*Lead, Proton reactions), (*Nucleons, *Particle production), Angular distribution, Conservation laws, Cross sections, Distribution, Energy, Energy spectra, Gev range 10-100, Inclusive interactions, Isospin, Linear momentum, Monte carlo method, Nuclear models, Phase space, Pions, Relativity theory, Statistics.

For abstract, see NSA 28 07, number 16753.

KFK-1730/GA PC$4.00/MF$1.45
Kernforschungszentrum, Karlsruhe (West Germany). Institut fuer Radiochemie.
COMPARISON OF MODELS FOR CALCULATING EXCITATION FUNCTIONS.
H. F. Roehm, K. A. Keller, and H. Muenzel. May 73, 37p
U.S. Sales Only.

Descriptors: (*Nuclear reactions, *Excitation functions), Accuracy, Comparative evaluations, Nuclear models.

For abstract, see NSA 28 08, number 20002.

KFKI-73-17/GA PC$3.50/MF$1.45
Magyar Tudomanyos Akademia Kozponti Fizikai Kutato Intezete, Budapest.
PRODUCTION OF GAMMA QUANTA IN PI EXP - -N INTERACTIONS AT 40 GEV/C.
27p -
Unclassified report
Only.

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KFKI-73-2/GA PC$4.75/MF$1.45
Magyar Tudomanyos Akademia Kozponti Fizikai Kutato Intezete, Budapest.
ICL VERSION OF THE 05R PROGRAM SYSTEM.
I. Lux, and O. L. Koblinger. Nov 72, 55p
U.S. Sales Only.

Descriptors: (*Computer codes, *D codes), (*Neutron transport theory, Computer codes), Fortran, Icl computers, Monte carlo method, O codes, Programming, R codes.

For abstract, see NSA 28 07, number 16835.

LA-UR-73-1010/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
PROMPT NEUTRONS FROM THE SPONTANEOUS FISSION OF FERMIUM-257.
J. P. Balagna, J. A. Farrell, G. P. Ford, A. Hemmendinger, and D. C. Hoffman. 1973, 17p
CONF-730823-1, SM-174/77
Contract W-7405-eng-36

Descriptors: (*Fermium 257, *Spontaneous fission), (*Californium 252, Spontaneous fission), (*Fission fragments, *Mass), (*Prompt neutrons, *Multiplicity), Half-life.

For abstract, see NSA 28 08, number 19979.

LA-UR-73-1036/GA PC$4.50/MF$1.45
Los Alamos Scientific Lab., N. Mex.
CALCULATION OF FISSION BARRIERS.
P. Moeller, and J. R. Nix. 1 Aug 73, 50p CONF-730823-7, SM-174/202
Contract W-7405-eng-36

Descriptors: (*Fission, *Potential energy), Nuclear deformation, Nuclear potential, Reviews.

For abstract, see NSA 28 08, number 20006.

LA-UR-73-625/GA PC$3.25/MF$1.45
Los Alamos Scientific Lab., N. Mex.
REPORTS TO THE U.S. NUCLEAR DATA COMMITTEE.
M. S. Moore. 22p CONF-730535-1
Contract W-7405-eng-36

Descriptors: (*Nuclear physics, *Research programs), (*X-ray fluorescence analysis, Research programs), (*Thermonuclear reactions, Research programs), Data, Lasl, Nuclear structure.

For abstract, see NSA 28 08, number 19811.

LA-UR-73-889/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
NAIVE VIEW OF HIGH ENERGY HADRON--NUCLEUS COLLISIONS.
A. S. Goldhaber. 1973, 7p CONF-730642-3

Descriptors: (*Nucleon reactions, *Multiple scattering), (*Fireball model, Nucleon reactions), (*Nucleon beams, Multiple scattering), Gev range 100-1000, Hadrons, Nuclear cascades, Nuclear emulsions, Particle production.

For abstract, see NSA 28 08, number 19684.

LA-UR-73-894/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex. Illinois Univ., Urbana.
SEARCH FOR A PARITY-VIOLATING CONTRIBUTION TO NUCLEON--NUCLEON SCATTERING.
D. E. Nagle, C. F. Hwang, N. Jarmie, P. A. Lovoi, and J. L. McKibben. 1973, 11p CONF-730642-4

Descriptors: (*Proton-proton interactions, *P invariance), (*Protons, *Proton beams), Cross sections, Mev range 10-100, Polarization, Weak interactions.

For abstract, see NSA 28 08, number 19527.

LA-UR-73-960/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex. Oak Ridge National Lab., Tenn.
DETERMINATION OF SPINS OF INTERMEDIATE STRUCTURE RESONANCES IN SUBTHRESHOLD FISSION.
G. A. Keyworth, J. R. Lemley, C. E. Olsen, F. T. Seibel, and J. W. T. Dabbs. 1973, 17p CONF-730823-5, SM-174/65

Descriptors: (*Neptunium 237, Neutron reactions), (*Uranium 235, Neutron reactions), (*Neutron reactions, *Fission), (*Neutron beams, Fission), Resonance, Spin, Epithermal neutrons, Ev range 01-10, Ev range 10-100, Excitation functions, Total cross sections, Transmission, Energy levels, Level widths, Neptunium 238, Uranium 236.

For abstract, see NSA 28 08, number 19977.

LA-UR-73-968/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
PROMPT AND DELAYED NEUTRON YIELDS FROM LOW ENERGY PHOTOFISSION OF EXP 232 TH, EXP 235 U, EXP 238 U, AND EXP 239 PU.
J. T. Caldwell, E. J. Dowdy, and G. M. Worth. 1973, 20p CONF-730823-2, SM-174/100
Contract W-7405-eng-36

Descriptors: (*Thorium 232, *Photonuclear reactions), (*Uranium 235, Photonuclear reactions), (*Uranium 238, Photonuclear reactions), (*Plutonium 239, Photonuclear reactions), Delayed neutrons, Fission yield, Level widths, Multiplicity, Photofission, Photon beams, Prompt neutrons, Mev range 01-10, Mev range 10-100.

For abstract, see NSA 28 08, number 19978.

LA-UR-73-972/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
CALCULATION OF FISSION BARRIERS FOR HEAVY NEUTRON-RICH NUCLEI.
W. M. Howard, and J. R. Nix. 1973, 20p CONF-730823-3, SM-174/60
Contract W-7405-eng-36

Descriptors: (*Trans 104 elements, *Nucleosynthesis), (*Heavy nuclei, *Binding energy), Fission, Neutrons, Nuclear explosions, Nuclear reaction kinetics, Potential energy, R process, Thermonuclear explosions.

For abstract, see NSA 28 08, number 20004.

LA-UR-73-981/GA PC$3.25/MF$1.45
Los Alamos Scientific Lab., N. Mex.
DYNAMICS OF FISSION AND FUSION WITH APPLICATIONS TO THE FORMATION OF SUPERHEAVY NUCLEI.
A. J. Sierk, and J. R. Nix. 1973, 23p CONF-730823-10, SM-174/74
Contract W-7405-eng-36

Descriptors: (*Fission, *Nuclear reaction kinetics), (*Heavy ion reactions, Fusion reactions), (*Fusion reactions, Nuclear reaction kinetics), (*Ion beams, *Nuclear reactions), Heavy ions, Liquid drop model, Nucleosynthesis, Trans 104 elements.

For abstract, see NSA 28 08, number 20005.

LA-5172/GA PC$5.45/MF$1.45
Los Alamos Scientific Lab., N. Mex.
EVALUATED NEUTRON-INDUCED CROSS SECTIONS FOR EXP 239 PU AND EXP 240 PU.
R. E. Hunter, L. Stewart, and T. J. Hirons. Jun 73, 52p
Contract W-7405-eng-36

Descriptors: (*Plutonium 239, Neutron reactions), (*Plutonium 240, Neutron reactions), (*Neutron reactions, *Capture), (*Neutron beams, Capture), Compound nucleus reactions, Cross sections, Elastic scattering, Excitation functions, Fast fission, Fast neutrons, Gamma radiation, Inelastic scattering, Intermediate neutrons, Kev range 10-100, Kev range 100-1000, Mev range 01-10, Mev range 10-100, Multiplicity, Neutrons, Total cross sections, Angular distribution, Delayed neutrons, Nuclear temperature, Prompt neutrons.

For abstract, see NSA 28 07, number 17045.

LA-5176/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
G EXP 3 : GENERAL PURPOSE GAMMA-RAY SCATTERING PROGRAM.
R. E. Malenfant. Jun 73, 45p
Contract W-7405-eng-36

Descriptors: (*Gamma transport theory, Computer codes), (*Computer codes, *G codes), Gamma radiation, Multiple scattering, Scattering.

For abstract, see NSA 28 08, number 20138.

LA-5253-MS/GA PC$10.60/MF$1.45
Los Alamos Scientific Lab., N. Mex.
COMPILATION OF REQUESTS FOR NUCLEAR DATA.
L. Stewart, M. S. Moore, and H. T. Motz. Jun 73, 334p USNDC-6
Contract W-7405-eng-36

Descriptors: (*Nuclear reactions, *Data), Cross sections.

For abstract, see NSA 28 08, number 19904.

LA-5274-T/GA PC$10.60/MF$1.45
Los Alamos Scientific Lab., N. Mex.
EXACT ANALYTICAL SOLUTION TO THE TWO-BODY PROBLEM WITH A SEPARABLE (NONLOCAL) CENTRAL AND TENSOR INTERACTION.
C. E. Lee. Jul 73, 409p
Contract W-7405-eng-36

Descriptors: (*Nuclear matter, *Nucleon-nucleon potential), Angular momentum, Bound state, Central potential, Deuterons, Effective range theory, Interaction range, Interactions, Linear momentum, Mathematical space, Nonlocal potential, Nuclear cores, Nucleon-nucleon interactions, Phase shift, S waves, Scattering lengths, Schroedinger equation, Spin, Tensors, Two-body problem.

For abstract, see NSA 28 08, number 20003.

LBL-1678/GA PC$4.25/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
SOME NEW DEVELOPMENTS IN DIRECT REACTIONS INDUCED BY HEAVY IONS.
W. von Oertzen. Apr 73, 42p CONF-730450-1
Contract W-7405-eng-48

Descriptors: (*Heavy ion reactions, *Direct reactions), (*Ion beams, Direct reactions), Heavy ions, Nuclear reaction kinetics, Reviews, Transfer reactions.

For abstract, see NSA 28 07, number 17074.

LBL-1690/GA PC$9.25/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
SYSTEMATICS OF THE (ALPHA ,2 ALPHA) REACTION AT E/SUB ALPHA / = 90 MEV.
J. D. Sherman. May 73, 142p
Contract W-7405-eng-48

Descriptors: (*Carbon 12, *Alpha reactions), (*Calcium 44, Alpha reactions), (*Oxygen 16, Alpha reactions), (*Magnesium 24, Alpha reactions), Alpha beams, Alpha particles, Alpha spectra, Angular correlation, Argon 36, Calcium 40, Cross sections, Distorted wave theory, Dwba, Impulse approximation, Magnesium 26, Mev range 10-100, Neon 22, Nickel 62, Nuclear reaction kinetics, Quasi-elastic scattering, Silicon 28, Silicon 30, Zinc 66, Argon 40, Beryllium 8, Correlations, Linear momentum, Energy, Neon 20, Energy levels, Spectroscopic factors.

For abstract, see NSA 28 07, number 16907.

LBL-1704/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
DETERMINATION OF THE AXIAL VECTOR FORM FACTOR IN THE RADIATIVE DECAY OF THE PION.
A. Stetz, J. Carroll, N. Chirapatpimol, M. Dixit, and G. Igo. May 73, 28p CONF-730454-1
Contract W-7405-eng-48

Descriptors: (*Pions, *Decay), Branching ratio, Electrons, Emission, Form factors, Neutrinos, Photons, Vectors.

For abstract, see NSA 28 08, number 19514.

LBL-1772/GA PC$3.50/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.

NEW K PI PARTIAL WAVE ANALYSIS BELOW 1 GEV K PI MASS.
A. Barbaro-Galtieri, M. J. Matison, M. Alston-Garnjost, S. M. Flatte, and J. H. Friedman. Jun 73, 28p CONF-730319-5
Contract W-7405-eng-48

Descriptors: (*Pion-kaon interactions, *Partial waves), (*Kaons, *Pion beams), Angular distribution, Angular distribution, Cross sections, Distribution, Gev range 01-10, Gev range 10-100, Kaon-proton interactions, Kaons plus, Linear momentum, Linear momentum transfer, Mass, N*resonances, Phase shift, Pions minus.

For abstract, see NSA 28 08, number 19654.

LBL-1788/GA PC$6.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
PART I. AN ESTIMATE OF THE POMERANCHUKON-RHO CUT FOR PI-NUCLEON SCATTERING. PART II. FIXED POLES AND FESR FOR K EXP + P SCATTERING.
M. Dubovoy. 4 Jun 73, 79p
Contract W-7405-eng-48

Descriptors: (*Pion-proton interactions, *Inclusive interactions), (*Kaon-prcton interactions, *Elastic scattering), (*Protons, *Kaon beams), Conservation laws, Differential cross sections, Exchange degeneracy, Helicity, Phase shift, Pomeranchuk poles, Regge trajectories, Scattering amplitudes, Sum rules, Coupling, Interference, Linear momentum, Missing mass, Particle production, Pions minus, Polarization, Regge poles, Rho-765 resonances, Total cross sections, Kaons plus.

For abstract, see NSA 28 08, number 19664.

LBL-2012/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
CHANGING SIGMA (1660) BRANCHING RATIO.
P. H. Eberhard. May 73, 7p CONF-730448-2
Contract W-7405-eng-48

Descriptors: (*Sigma-1670 resonances, *Decay), Branching ratio, Emission, Pions, Sigma particles.

For abstract, see NSA 28 08, number 19528.

LBL-2017/GA PC$3.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
PARTIAL WAVE ANALYSES OF PI EXP + P IMPLIES PI EXP 0 PI EXP + P AND K EXP + SIGMA EXP + AT 1.28 TO 1.84 GEV/C.
A. Kernan, S. Y. Fung, U. Mehtani, Y. Williamson, and W. Michael. May 73, 6p CONF-730448-1
Contract W-7405-eng-48

Descriptors: (*Pion-proton interactions, *Partial waves), (*Protons, *Pion beams), Angular distribution, Argand diagrams, Dalitz plot, Delta-1236 resonances, Energy, Exchange interactions, Gev range 01-10, Helicity, Kaons plus, Linear momentum, Particle production, Pions neutral, Pions plus, Protons, Resonance, Rho-765 resonances, Sigma plus, Spin, Total cross sections.

For abstract, see NSA 28 07, number 16549.

LBL-2052/GA PC$4.00/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
HIGH-ENERGY HEAVY IONS: A NEW AREA FOR PHYSICS RESEARCH.
H. H. Heckman. 15 Jun 73, 37p CONF-730642-7
Contract W-7405-eng-48

Descriptors: (*Heavy ion reactions, *Reviews), (*Ion beams, *Nuclear reactions), Bevatron, Coherent production, Gev range 01-10, Gev range 10-100, Heavy ions, Hypernuclei, Pions, Research programs.

For abstract, see NSA 28 08, number 19829.

LBL-2067/GA PC$4.75/MF$1.45
California Univ., Berkeley. Lawrence Berkeley Lab.
MEASUREMENT OF THE K EXP - PI EXP - ELASTIC CROSS SECTION AND STUDY OF THE K EXP - PI EXP + PI EXP - MASS SPECTRUM IN THE REACTION K EXP - P IMPLIES K EXP - P PI EXP + PI EXP - AT 2.7 GEV/C.
A. R. Kirschbaum. Apr 73, 52p
Contract W-7405-eng-48

Descriptors: (*Pion-kaon interactions, *Elastic scattering), (*Kaon-proton interactions, *Mass), (*Kaons, *Pion beams), (*Protons, *Kaon beams), Cross sections, Gev range 01-10, K*resonances, Kaons minus, Linear momentum, Ope model, Particle production, Pions minus.

For abstract, see NSA 28 08, number 19540.

LUIP-CR-73-2/GA PC$6.50/MF$1.45
Lund Univ. (Sweden). Dept. Of Physics.
PHOTOMETRIC MEASUREMENTS ON TRACKS OF VERY HEAVY COSMIC RAY PARTICLES WITH E > 1 GEV/NUCLEON.
R. Andersson, L. Larsson, and O. Mathiesen. Feb 73, 87p
U.S. Sales Only.

Descriptors: (*Primary cosmic radiation, *Particle tracks), (*Intermediate mass nuclei, Primary cosmic radiation), Atomic number, Errors, Gev range 01-10, Nuclear emulsions, Particles, Photometry, Relativistic range, Velocity, Width.

For abstract, see NSA 28 07, number 16222.

LUNP-7306/GA PC$3.25/MF$1.45
Lund Univ. (Sweden). Dept. Of Physics.
RECOIL PROPERTIES OF EXP 27 MG FROM THE EXP 27 AL(GAMMA , PI EXP +) EXP 27 MG REACTION.
B. Friberg, I. Blomqvist, and B. Forkman. Apr 73, 23p
U.S. Sales Only.

Descriptors: (*Magnesium 27, *Range), (*Aluminium 27, *Photonuclear reactions), Bremsstrahlung, Excitation functions, Fermi gas model, Impulse approximation, Mev range 100-1000, Photon beams, Pions plus, Recoils.

For abstract, see NSA 28 08, number 19852.

LYCEN-7275/GA PC$7.50/MF$1.45
Lyon Univ. (France). Institut de Physique Nucleaire.
STUDY OF FINAL STATE INTERACTION IN THE P + D REACTION AND IN OTHER FEW NUCLEON REACTIONS.
M. Chemarin. Dec 72, 106p
In French. U.S. Sales Only.

Descriptors: (*Proton-deuteron interactions, *Final-state interactions), (*Deuteron-deuteron interactions, Final-state interactions), (*Deuteron reactions, *Breakup reactions), (*Helium 4, Deuteron reactions), Angular distribution, Correlations, Deuterons, Faddeev equations, Helium 3, Lithium 6, Mev range 10-100, Neutrons, Nuclear reaction kinetics, Protons, S waves, Three-body problem, Two-body problem.

For abstract, see NSA 28 07, number 16530.

LYCEN-7303/GA PC$3.50/MF$1.45
Lyon Univ. (France). Institut de Physique Nucleaire.
PRECOMPOUND PROCESSES IN (ALPHA ,N) REACTIONS.
A. Alevra, R. Dumitrescu, I. R. Lukas, M. T. Magda, and D. Plostinaru. Jan 73, 30p
U.S. Sales Only.

Descriptors: (*Iron 56, *Alpha reactions), (*Iron 57, Alpha reactions), (*Rhodium 103, Alpha reactions), Compound nuclei, Compound nucleus reactions, Direct reactions, Mev range 10-100, Neutrons, Nuclear reaction kinetics, Energy spectra, Nickel 60, Antimony 118, Indium 115, Silver 106, Nickel 59, Tellurium 121, Tin 118.

For abstract, see NSA 28 07, number 16980.

LYCEN-7304/GA PC$5.75/MF$1.45
Lyon Univ. (France). Institut de Physique Nucleaire.
ALPHA EMISSION SPECTRA OF THE EXP 58 CO NUCLEUS EXCITED TO 39 MEV IN THE FOLLOWING CHANNELS P + EXP 57 FE, D + EXP 56 FE, AND EXP 3 HE + EXP 55 MN. PRE-EQUILIBRIUM ALPHA DE-EXCITATION.
G. Hollinger. Jan 73, 71p
In French. U.S. Sales Only.

Descriptors: (*Cobalt 58, *Compound nuclei), (*Proton reactions, *Compound nucleus reactions), (*Iron 57, Proton reactions), (*Deuteron reactions, Compound nucleus reactions), Alpha particles, Alpha spectra, Angular distribution, Cluster model, Excitons, Mev range 10-100, Nuclear structure, Partial waves, Particle-hole model, Statistical models, Iron 56, Manganese 54, Helium 3 reactions, Manganese 55.

For abstract, see NSA 28 07, number 16932.

N-73-18678/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
ANALYSIS OF TEMPERATURE-DEPENDENT NEUTRON TRANSMISSION AND SELF-INDICATION MEASUREMENTS ON TANTALUM AT 2-KEV NEUTRON ENERGY.
T. T. Semler. Mar 73, 47p NASA-TN-D-7214

Descriptors: (*Tantalum, *Neutron transport), (*Neutrons, *Transmission), Cross sections, Doppler coefficient, Kev range 01-10, Resonance.

For abstract, see NSA 28 08, number 19797.

N-73-19698/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
ELECTRON EMISSION PRODUCED BY PHOTOINTERACTIONS IN A SLAB TARGET.
B. E. Thinger, and J. A. Jr. Dayton. Mar 73, 19p NASA-TM-X-2756

Descriptors: (*Photoelectric emission, *Energy spectra), Electrons, Energy transfer, Slabs, Targets, Tungsten.

For abstract, see NSA 28 08, number 20139.

N-73-19704/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
SELF-CONSISTENT PAULI CORRECTIONS IN BRUECKNER--HARTREE--FOCK CALCULATIONS.
R. C. Braley, and W. F. Ford. Mar 72, 12p NASA-TM-X-68197

Descriptors: Corrections, Deformed nuclei, Energy, Matrices, Probability, Renormalization, Symmetry.

For abstract, see NSA 28 08, number 20007.

NP-19797/GA PC$3.50/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
INTEGRAL EQUATIONS FOR N-PARTICLE SCATTERING.
G. Bencze. Mar 73, 28p
U.S. Sales Only.

Descriptors: (*Scattering amplitudes, *Many-body problem), Hamiltonians, Integral equations, Kernels, Lippmann-schwinger equation, Mathematical operators.

For abstract, see NSA 28 07, number 16795.

NP-19799/GA PC$3.25/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
EXACT BOUNDS FOR THE FORM FACTOR OF K/SUB L3/ DECAY.
L. Tataru. 1972, 24p
U.S. Sales Only.

Descriptors: (*Kaons, *Leptonic decay), Boundary conditions, Form factors, Matrix elements, Propagator, Scalars, Strangeness, Sum rules, Symmetry breaking, Unitarity.

For abstract, see NSA 28 07, number 16653.

NP-19800/GA PC$3.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
IS CP VIOLATED IN THE (3,3) + (3,3) MODEL OF THE CHIRAL SYMMETRY.
L. Saliu, and L. Tataru. 1972, 11p
U.S. Sales Only.

Descriptors: (*Chiral symmetry, *Cp invariance), Chirality, Hamiltonians, Matrices, Matrix elements, Particle models, Symmetry breaking, Symmetry groups, Vectors.

For abstract, see NSA 28 07, number 16768.

NP-19801/GA PC$3.25/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
INVARIANT DESCRIPTION OF PERIPHERAL THREE-PARTICLE FINAL STATES.
E. Byckling, R. Raitio, and J. Tuominiemi. 1972, 22p
U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Final-state interactions), Distribution, Gev range 10-100, Gev range 100-1000, Linear momentum, Matrix elements, Monte carlo method, Neutrons, Particle production, Peripheral collisions, Pions plus, Protons, Tev range, Three-body problem.

For abstract, see NSA 28 07, number 16754.

NP-19802/GA PC$3.00/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
RADIAL EXCITATIONS AND THE RHO'.
R. Raitio, and M. Roos. 1973, 10p
U.S. Sales Only.

Descriptors: (*Photon-proton interactions, *Cross sections), (*Omega-784 resonances, *Photoproduction), (*Phi-1019 resonances, Photoproduction), Coupling, Excitation, Isovectors, Mass, N-1470 resonances, Photons, Quark model, Quarks, Rho-1600 resonances, Selection rules, Spin, Vector mesons.

For abstract, see NSA 28 07, number 16696.

NP-19803/GA PC$3.25/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
EFFECT OF THE DELTA (1236) IN NUCLEAR MATTER.
A. M. Green, T. K. Dahlblom, and T. Kouki. 1972, 23p
U.S. Sales Only.

Descriptors: (*Nuclear matter, *Binding energy), (*Delta-1236 resonances, Nuclear matter), Corrections, Correlation functions, Diagrams, Nuclear forces, Pion-nucleon interactions, Scattering amplitudes, Three-body problem.

For abstract, see NSA 28 07, number 17075.

NP-19804/GA PC$3.25/MF$1.45
Jyvaskyla Univ. (Finland). Dept. Of Physics.
MONTE CARLO SIMULATION OF HIGH-ENERGY REACTIONS ACCORDING TO THE FRAGMENTATION MODEL.
P. Pirilae, and P. V. Ruuskanen. Feb 73, 21p
U.S. Sales Only.

Descriptors: (*Computer codes, *S codes), (*Pion-proton interactions, *Final-state interactions), (*Pion-pion interactions, Final-state interactions), (*Proton-proton interactions, Final-state interactions), Cdc computers, Fortran, Linear momentum, Monte carlo method, Particle models, Particle production, Pions.

For abstract, see NSA 28 07, number 16755.

NP-19810/GA PC$8.00/MF$1.45
Munich Univ. (West Germany).
ANALYSIS OF THE REACTION PI EXP - P IMPLIES PI EXP - PI EXP - PI EXP + P AT 25 AND 40 GEV/C.
R. Klanner. 1973, 118p
U.S. Sales Only.

Descriptors: (*A1-1070 resonances, *Decay), (*A2-1310 resonances, Decay), (*Rho-765 resonances, *Particle production), Angular momentum, Cross sections, Differential cross sections, Effective mass, Energy, F-1260 resonances, Gev range 10-100, Linear momentum, Mass, Parity, Particle widths, Pion-proton interactions, Pions minus, Pions plus, Polarization, Protons, Spin, Total cross sections.

For abstract, see NSA 28 08, number 19541.

NP-19813/GA PC$3.75/MF$1.45
Bergen Univ. (Norway). Dept. Of Physics.
EXP 207 PB(D,P) EXP 208 PB REACTION WITH HIGH RESOLUTION.
P. B. Void, J. O. Andreassen, J. R. Lien, A. Graue, and E. R. Cosman. 1973, 31p
U.S. Sales Only.

Descriptors: (*Lead 207, Deuteron reactions), (*Lead 208, *Energy levels), (*Deuteron reactions, *Stripping), Angular distribution, Deuteron beams, Dwba, Energy resolution, Energy spectra, Mev range 10-100, Neutrons, Protons, Energy-level transitions, Isobaric analogs, Nuclear structure, Pairing energy, Particle-hole model.

For abstract, see NSA 28 08, number 19949.

NP-19818/GA PC$8.75/MF$1.45
Daresbury Nuclear Physics Lab. (England).
DARESBURY NUCLEAR PHYSICS LABORATORY ANNUAL REPORT, 1972.
1973, 131p
U.S. Sales Only.

Descriptors: (*High energy physics, *Research programs), (*Electromagnetic interactions, Research programs), Accelerator facilities, Buildings, Cern, Computers, Documentation, Electronic equipment, Management, Meetings, Nina, Nuclear structure, Planning, Radiation protection, Reviews, Safety, Synchrotron radiation, United kingdom organizations.

For abstract, see NSA 28 08, number 19515.

N73-30687/0GA PC$3.00/MF$1.45
Laboratoire de Physique Theorique et des Hautes Energies, Orsay (France).
BARYON SPECTROSCOPY AND REGULARITIES BETWEEN SU(6) AND SU(3) MASS BREAKING PARAMETERS.
M. Fontannaz. Jul 73, 10p LPTHE-73/21

Descriptors: *Baryons, *Group theory, *Matrices (Mathematics), *Spectroscopy, *Theoretical physics, Breaking, Quarks, Relativistic particles.

For abstract, see STAR 1121

N73-30688/8GA PC$3.25/MF$1.45
Laboratoire de Physique Theorique et des Hautes Energies, Orsay (France).
STRING MODEL AND MULTIPRODUCTION.
X. Artru, and G. Mennessier. Jul 73, 43p LPTHE-73/22
Subm-Submitted for Publication.

Descriptors: *High energy interactions, *Nuclear models, *Quantum numbers, *Theoretical physics, Group theory, Hadrons, Matrices (Mathematics), Particle collisions.

For abstract, see STAR 1121

N73-31406/4GA PC$3.00/MF$1.45
Louisiana State Univ., Baton Rouge. Dept. of Physics and Astronomy.
MONTE CARLO SIMULATION OF THE NUCLEAR-ELECTROMAGNETIC CASCADE DEVELOPMENT AND THE ENERGY RESPONSE OF IONIZATION SPECTROMETERS.
Final Report, 1 Jul. 1970 - 30 Jun. 1973.
W. V. Jones. 29 Jun 73, 18p NASA-CR-133999
Contract NAS9-10986

Descriptors: *Cosmic rays, *Electromagnetic interactions, *Monte carlo method, *Nuclear interactions, Computerized simulation, Hadrons, Heavy nuclei, Ionization, Pions, Spectrometers.

For abstract, see STAR 1122

ORNL-TM-3994/GA PC$7.75/MF$1.45
Oak Ridge National Lab., Tenn.
MACK: COMPUTER PROGRAM TO CALCULATE NEUTRON ENERGY RELEASE PARAMETERS (FLUENCE-TO-KERMA FACTORS) AND MULTIGROUP NEUTRON REACTION CROSS SECTIONS FROM NUCLEAR DATA IN ENDF FORMAT.
M. A. Abdou, C. W. Maynard, and R. Q. Wright. Jul 73, 112p
Contract W-7405-eng-26

Descriptors: (*Computer codes, *M codes), (*Neutron reactions, *Cross sections), (*Neutron beams, Cross sections), Dose rates, Energy losses, Fortran, Heating, Ibm computers, Kerma, Multigroup theory, Neutron fluence, Nuclear reactions, Univac computers.

For abstract, see NSA 28 08, number 19798.

ORNL-tr-2652/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr).
APPROXIMATE METHOD OF CALCULATING THE INTERACTION OF FAST IONS WITH NUCLEI.
V. C. Barashenkov, E. S. Gavrilov, and S. M. Eliseev. 5p
Translated from JINR--P2-6423.

Descriptors: (*Alpha particles, *Mean free path), (*Ion beams, *Nuclear reactions), Cross sections, Glauber theory, Heavy ion reactions, Heavy ions, Mev range 100-1000, Nuclear emulsions, Nucleon-nucleon interactions, Scattering amplitudes.

For abstract, see NSA 28 07, number 17076.

ORNL-tr-2694/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr).
ENERGY DEPENDENCE OF THE RATIO GAMMA/SUB N/GAMMA/SUB F/ IN THE REGION OF TRANSURANIUM ELEMENTS.
V. S. Barashenkov, F. G. Zheregi, A. S. Il'inov, and V. D. Toneev. 1972, 4p
Translated from JINR--P7-6619.

Descriptors: (*Transuranium elements, *Energy levels), (*Fermium 254, Energy levels), Energy dependence, Fermi gas model, Level widths.

For abstract, see NSA 28 08, number 19982.

ORNL-tr-2701/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr).
USE OF THE JACKSON--SIKKELAND METHOD FOR CALCULATING PRODUCTION CROSS-SECTIONS FOR SUPERHEAVY ELEMENTS.
A. S. Il'inov. 1973, 14p
Translated by Martha Gerrard (Oak Ridge National Lab., Tenn.) from JINR--P7-7108.

Descriptors: (*Heavy ion reactions, *Fusion reactions), (*Heavy nuclei, Heavy ion reactions), (*Ion beams, Fusion reactions), Compound nucleus reactions, Excitation functions, Heavy ions, Jackson model, Neutrons, Nuclear reactions, Trans 104 elements.

For abstract, see NSA 28 08, number 20009.

ORNL-4804/GA PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn.
EXP 238 U NEUTRON ELASTIC-SCATTERING CROSS SECTIONS FROM 6.44 TO 8.56 MEV.
W. E. Kinney, and F. G. Perey. Jun 73, 17p
Contract W-7405-eng-26

Descriptors: (*Uranium 238, Neutron reactions), (*Neutron reactions, *Elastic scattering), (*Neutron beams, Elastic scattering), Angular distribution, Comparative evaluations, Differential cross sections, Excitation functions, Fast neutrons, Inelastic scattering, Mev range 01-10, Nuclear reactions.

For abstract, see NSA 28 08, number 19981.

ORO-2408-51/GA PC$3.50/MF$1.45
North Carolina Univ., Chapel Hill.
STUDIES OF NUCLEAR PROCESSES. PROGRESS REPORT, JUNE 1, 1972--MAY 31, 1973.
T. B. Clegg, E. J. Ludwig, E. Merzbacher, S. M. Shafroth, and W. J. Thompson. 1973, 29p
Contract AT(40-1)-2408

Descriptors: (*Nuclear physics, *Research programs), (*Van de graaff accelerators, *Operation), North carolina, Nuclear reactions, Nuclear theory, Polarized beams.

For abstract, see NSA 28 08, number 19830.

ORO-2504-192/GA PC$11.50/MF$1.45
Maryland Univ., College Park. Dept. Of Physics and Astronomy.
K EXP + P ELASTIC SCATTERING BETWEEN 0.865 AND 2.125 GEV/C.
J. H. Goldman. Dec 72, 187p

Descriptors: (*Protons, *Kaon beams), (*Kaon-proton interactions, *Differential cross sections), Elastic scattering, Linear momentum, Mev range 100-1000, Total cross sections, Z*resonances.

For abstract, see NSA 28 08, number 19542.

ORO-3992-118/GA PC$4.25/MF$1.45
Texas Univ., Austin. Center for Particle Theory.
STUDY OF THE K/SUB L3/ FORM FACTORS BY THE ON-MASS-SHELL CURRENT ALGEBRA.
A. A. Golestaneh. Feb 73, 42p CPT-173
Contract AT(40-1)-3992

Descriptors: (*Kaons, *Leptonic decay), Commutators, Current algebra, Decay amplitudes, Dispersion relations, Field theories, Form factors, K*resonances, Kappa-725 resonances, Linear momentum transfer, Mass, Mathematical operators, Matrix elements, Pseudoscalars, Strangeness, Su-3 groups, Vectors.

For abstract, see NSA 28 08, number 19618.

ORO-3992-120/GA PC$3.00/MF$1.45
Texas Univ., Austin. Center for Particle Theory.
METHOD OF CHARACTERISTICS AND CAUSALITY OF FIELD PROPAGATION.
P. M. Mathews, and M. Seetharaman. Feb 73, 7p CPT-174
Contract AT(40-1)-3992

Descriptors: (*Vector fields, *Causality), Coupling, Magnetic fields, Magnetic moments, Tachyons, Velocity.

For abstract, see NSA 28 08, number 20197.

ORO-3992-131/GA PC$3.75/MF$1.45
Texas Univ., Austin. Center for Particle Theory.
BOOTSTRAP EQUATIONS FOR FIREBALL DECAY.
C. B. Chiu, and R. J. Gleiser. Jun 73, 34p CPT-180
Contract AT(40-1)-3992

Descriptors: (*Fireball model, *Decay), (*Pions, *Energy spectra), (*Bootstrap model, Fireball model), Boundary conditions, Conservation laws, Correlations, Energy, Ground states, Kernels, Mass, Multiple production, Multiplicity, Rho-765 resonances, Statistics.

For abstract, see NSA 28 08, number 19554.

ORO-3992-133/GA PC$6.00/MF$1.45
Texas Univ., Austin. Center for Particle Theory.
PROGRESS REPORT ON RESEARCH PROGRAM IN ELEMENTARY PARTICLE THEORY, 1972--1973.
E. C. G. Sudarshan, and Y. Ne'eman. 1973, 78p CPT-182, AEC-133
Contract AT(40-1)-3992

Descriptors: (*High energy physics, *Research programs), Algebra, Electromagnetic interactions, Field theories, Strong interactions, Weak interactions.

For abstract, see NSA 28 07, number 16577.

ORO-4282-7/GA PC$4.50/MF$1.45
Arkansas Univ., Fayetteville. Dep!. Of Chemistry.
NUCLEAR CHEMISTRY. ANNUAL PROGRESS REPORT.
P. K. Kuroda. 31 Jul 73, 46p
Contract AT(40-1)-4282

Descriptors: (*Nuclear physics, *Research programs), Arkansas.

For abstract, see NSA 28 08, number 19905.

ORO-4317-21/GA PC$3.25/MF$1.45
Maryland Univ., College Park. Dept. Of Physics and Astronomy.
SINGULAR CORES IN THE THREE-BODY PROBLEM. II. NUMERICAL SOLUTION. TECHNICAL REPORT NO. 73-119.
D. D. Brayshaw. May 73, 23p

Descriptors: (*Three-body problem, *Nuclear potential), Binding energy, Bosons, Nuclear models, Singularity.

For abstract, see NSA 28 08, number 20010.

ORO-4317-23/GA PC$3.00/MF$1.45
Maryland Univ., College Park. Dept. Of Physics and Astronomy.
THEORY OF THE PION-NUCLEUS OPTICAL POTENTIAL.
J. B. Cammarata, and M. K. Banerjee. Jun 73, 13p CONF-730642-2

Descriptors: (*Pion reactions, *Elastic scattering), (*Pion beams, Elastic scattering), (*Optical models, Pion reactions), Cross sections, Crossing symmetry, Green function, Hamiltonians, Nuclear potential, Nuclei, Total cross sections, Wave functions.

For abstract, see NSA 28 08, number 20011.

ORO-4449-1/GA PC$3.00/MF$1.45
Texas Agricultural and Mechanical Univ., College Station.
STUDY OF THE NEUTRON--PROTON INTERACTION IN THE 300 TO 700 MEV ENERGY REGION.
L. C. Northcliffe. 1973, 4p
Contract AT(40-1)-4449

Descriptors: (*Protons, *Neutron beams), Mev range 100-1000, Proton-neutron interactions.

For abstract, see NSA 28 08, number 19530.

RL-73-12/GA PC$3.00/MF$1.45
Rutherford High Energy Lab., Chilton (England).
MAGNETIC MOMENT OF THE DELTA EXP ++ IN A BOOTSTRAP MODEL.
Y. A. Chao, and R. K. P. Zia. Apr 73, 9p
U.S. Sales Only.

Descriptors: (*Bootstrap model, *Delta-1236 resonances), Baryon-exchange models, Coupling, Magnetic moments, Neutrons, Pion-proton interactions, Pions plus, Pseudoscalars, Quarks.

For abstract, see NSA 28 07, number 16594.

RL-73-17/GA PC$3.00/MF$1.45
Rutherford High Energy Lab., Chilton (England).
SU(3) X SU(3) MODEL FOR HADRONS AND LEPTONS.
G. G. Ross. Apr 73, 9p
U.S. Sales Only.

Descriptors: (*Su-3 groups, *Hadrons), (*Leptons, Su-3 groups), Currents, Electromagnetic interactions, Gauge invariance, Particle models, Particle structure, Quarks, Strangeness, Weak interactions.

For abstract, see NSA 28 07, number 16776.

RL-73-18/GA PC$11.00/MF$1.45
Rutherford High Energy Lab., Chilton (England).
PROCEEDINGS OF AN INFORMAL MEETING ON LINKS BETWEEN WEAK AND ELECTROMAGNETIC INTERACTIONS, RUTHERFORD HIGH ENERGY LABORATORY, 24-25 FEBRUARY 1973.
W. T. Toner, and R. K. P. Zia. 1973, 178p CONF-730216-
U.S. Sales Only.

Descriptors: (*Weak interactions, *Meetings), (*Electromagnetic interactions, Meetings), Leading abstract.

For abstract, see NSA 28 08, number 19567.

RL-73-31/GA PC$3.25/MF$1.45
Rutherford High Energy Lab., Chilton (England).
PI N AMPLITUDES AT LARGE MOMENTUM TRANSFER.
F. Elvekjaer, T. Inami, and R. J. N. Phillips. May 73, 25p

U.S. Sales Only.

Descriptors: (*Pion-nucleon interactions, *Scattering amplitudes), Argand diagrams, Energy, Energy transfer, Gev range 01-10, Gev range 10-100, Helicity, Interactions, Linear momentum transfer, Phase shift, Regge poles, Rho-765 resonances, Scattering, Spin flip.

For abstract, see NSA 28 07, number 16726.

RL-73-45/GA PC$3.00/MF$1.45
Rutherford High Energy Lab., Chilton (England).
HIGH TRANSVERSE MOMENTUM HADRON JET PRODUCTION IN A GLUON-EXCHANGE MODEL.
I. Montvay. Jun 73, 12p
U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Exchange interactions), Cascade showers, Coupling constants, Cross sections, Distribution, Energy spectra, Gluon model, Hadrons, Linear momentum, Particle production, Parton model, Parton model, Quantum numbers, Quarks, Scale invariance, Vectors.

For abstract, see NSA 28 07, number 16756.

RLO-1388-211/GA PC$3.00/MF$1.45
Washington Univ., Seattle.
RELATIVE EXCITATIONS OF THE EXP 237 PU SHAPE ISOMERS.
R. Vandenbosch, P. A. Russo, G. Sletten, and M. Mehta. 1973, 14p

Descriptors: (*Uranium 235, *Alpha reactions), (*Alpha beams, *Nuclear reactions), (*Plutonium 237, *Energy levels), Fission isomers, Isomeric nuclei, Excitation functions, Mev range 10-100, Neutrons, Nuclear reaction yield, Spin.

For abstract, see NSA 28 07, number 17046.

RLO-1388-212/GA PC$4.75/MF$1.45
Washington Univ., Seattle. Dept. Of Physics.
NUCLEON TRANSFER WITH OXYGEN IONS BELOW AND NEAR THE COULOMB BARRIER.
K. G. Nair, J. S. Blair, W. Reisdorf, W. R. Wharton, and W. J. Braithwaite. 1973, 51p

Descriptors: (*Cerium 140, Oxygen 16 reactions), (*Strontium 88, Oxygen 16 reactions), (*Oxygen 16 reactions, *Stripping), (*Oxygen 18 reactions, Stripping), Corrections, Coulomb correction, Dwba, Excitation functions, Mev range 10-100, Recoils, Spectroscopic factors, Transfer reactions, Energy spectra, Nitrogen 15, Oxygen 16 beams, Wave functions, Yttrium 89, Angular distribution, Differential cross sections, Praseodymium 141, Cerium 141, Neutron transfer, Oxygen 17, Oxygen 18 beams.

For abstract, see NSA 28 07, number 16981.

RLO-1388-213/GA PC$3.00/MF$1.45
Washington Univ., Seattle.
INFLUENCE OF THE DOUBLE BARRIER ON THE QUADRUPOLE ABSORPTION COMPONENT OF PHOTOFISSION.
R. Vandenbosch. 1973, 11p

Descriptors: (*Thorium 232, Photonuclear reactions), (*Plutonium 240, Photonuclear reactions), (*Photonuclear reactions, Photofission), (*Photofission, *Nuclear reaction kinetics), Angular distribution, Excitation functions, Nuclear potential, Quadrupoles.

For abstract, see NSA 28 07, number 17047.

RLO-1388-214/GA PC$3.00/MF$1.45
Washington Univ., Seattle. Dept. Of Physics.
RECOIL IN (EXP 16 O, EXP 15 N) REACTIONS ON 2S--1D AND 1F--2P SHELL NUCLEI.
R. M. DeVries. 1973, 7p

Descriptors: (*Light nuclei, *Heavy ion reactions), (*Intermediate mass nuclei, Heavy ion reactions), (*Oxygen 16 reactions, *Stripping), (*Oxygen 16 beams, Stripping), Aluminium 27, Angular distribution, Differential cross sections, Dwba, Magnesium 26, Mev range 10-100, Nitrogen 15, Nuclear reaction kinetics, Phosphorus 31, Recoils, Silicon 28, Silicon 30, Spectroscopic factors, Titanium 48, Transfer reactions, Vanadium 49.

For abstract, see NSA 28 07, number 16908.

RLO-1388-653/GA PC$3.75/MF$1.45
Washington Univ., Seattle. Dept. Of Physics.
REGGEON THEORY OF DIFFRACTION SCATTERING.
M. Baker. 1973, 33p CONF-730334-5

Descriptors: (*Proton-proton interactions, *Pomeranchuk particles), (*Protons, *Proton beams), Diffraction models, Elastic scattering, Regge poles, Reviews.

For abstract, see NSA 28 08, number 19685.

RLO-1388-655/GA PC$3.25/MF$1.45
Washington Univ., Seattle. Dept. Of Physics.
POMERON COUPLINGS.
R. C. Brower, and J. H. Weis. 1973, 24p CONF-730339-1

Descriptors: (*Pomeranchuk particles, *Coupling), Boundary conditions, Energy, Pomeranchuk poles, Scattering amplitudes, Singularity, Unitarity.

For abstract, see NSA 28 08, number 19710.

RLO-1388-657/GA PC$4.25/MF$1.45
Washington Univ., Seattle. Dept. Of Physics.
SYMMETRY VIOLATIONS.
E. M. Henley. 1973, 40p CONF-730642-6

Descriptors: (*Symmetry breaking, *Reviews), (*Electromagnetic interactions, Symmetry breaking), (*Strong interactions, Symmetry breaking), (*Weak interactions, Symmetry breaking), Isospin, Parity, T invariance.

For abstract, see NSA 28 08, number 19696.

SLA-73-5548/GA PC$3.00/MF$1.45
New Mexico Univ., Albuquerque.
TIME-DEPENDENT MULTICHANNEL COULOMB SCATTERING THEORY.
C. Chandler, and A. G. Gibson. 1973, 18p

Descriptors: (*Coulomb scattering, *Time dependence), Mathematical operators, Two-body problem.

For abstract, see NSA 28 08, number 19573.

SLA-73-562/GA PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
APPROXIMATION FOR X-RAY CROSS SECTIONS.
T. D. Sullivan. Jul 73, 26p

Descriptors: (*X radiation, *Cross sections), (*Photon collisions, Cross sections), Kev range, Photon transport, Total cross sections.

For abstract, see NSA 28 08, number 20142.

UCR-34-P-107-B-144/GA PC$7.50/MF$1.45
California Univ., Riverside.
STUDY OF THE REACTION PI EXP + + P IMPLIES RHO EXP + + P AT INCIDENT MOMENTA 1.28 TO 1.84 GEV/C.
Y. S. Williamson. Dec 72, 108p

Descriptors: (*Rho-765 resonances, *Particle production), (*Omega-784 resonances, *Obe model), (*Pions, Obe model), (*Delta-1236 resonances, *Mass), Absorption, Angular distribution, Boundary conditions, Bubble chambers, Density matrix, Differential cross sections, Gev range 01-10, Linear momentum, Matrix elements, N*resonances, N-1680 resonances, Particle widths, Pion beams, Pion-proton interactions, Protons, Protons.

For abstract, see NSA 28 07, number 16550.

UCR-34-P-107-B-146/GA PC$3.00/MF$1.45
California Univ., Riverside. California Univ., Berkeley. Lawrence Radiation Lab.
PARTIAL WAVE ANALYSIS OF PI EXP + P IMPLIES PI EXP 0 DELTA EXP ++ AT 1820 TO 2090 MEV.
U. Mehtani, S. Y. Fund, A. Kernan, T. L. Schalk, and Y. Williamson. 1972, 15p CONF-720923-15

Descriptors: (*Pion-proton interactions, *Partial waves), (*Delta-1950 resonances, *Particle production), (*N*resonances, *Decay), (*Rho-765 resonances, Particle production), Angular distribution, Argand diagrams, Cross sections, Dalitz plot, Density matrix, Emission, F waves, Gev range 01-10, Helicity, Matrix elements, Pion beams, Pions, Pions neutral, Pions plus, Protons.

For abstract, see NSA 28 08, number 19543.

UCR-34-P-107-B-162/GA PC$7.50/MF$1.45
California Univ., Riverside.
DIFFRACTION DISSOCIATION IN PI EXP - D INTERACTIONS AT 11.6 GEV/C.
Y. T. Oh. Jun 73, 107p

Descriptors: (*Pion-deuteron interactions, *Diffraction models), (*N*resonances, *Decay), (*N-1688 resonances, Decay), (*Al-1070 resonances, *Parity), Angular distribution, Conservation laws, Correlations, Coupling, Cross sections, Deck effect, Density matrix, Deuterons, Exchange interactions, F-1260 resonances, Gev range 10-100, Helicity, Interference, Isospin, Linear momentum, Matrix elements, Missing mass, Neutrons, Pi-1640 resonances, Pion beams, Pions minus, Pomeranchuk particles, Protons, Scattering amplitudes, Spin.

For abstract, see NSA 28 07, number 16551.

UCR-34-P-107-B-164/GA PC$3.25/MF$1.45
California Univ., Riverside.
ANNUAL REPORT.
A. Kernan, and R. T. Poe. May 73, 23p
Contract AT(04-3)-34

Descriptors: (*Hadron-hadron interactions, *Research programs), (*Hadrons, Research programs).

For abstract, see NSA 28 07, number 16552.

UCRL-51370/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
EVALUATED NEUTRON REACTION DATA FOR URANIUM 235.
R. J. Howerton, and M. H. MacGregor. 21 Mar 73, 28p
Contract W-7405-eng-48

Descriptors: (*Uranium 235, *Neutron reactions), (*Neutron beams, *Nuclear reactions), Angular distribution, Cross sections, Energy spectra, Errors, Fission, Gamma radiation, Neutron spectra, Neutrons.

For abstract, see NSA 28 07, number 17048.

UCRL-51401/GA PC$4.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
INTERPOLATION IN EXCITATION ENERGY FOR TWO-DIMENSIONAL TABULAR DATA.
S. T. Perkins, and R. J. Doyas. 7 Jun 73, 10p
Contract W-7405-eng-48

Descriptors: (*Neutron spectra, *Interpolation), (*Gamma spectra, Interpolation), (*Energy spectra, Interpolation), Data processing, Energy, Excitation, Inelastic scattering, Nuclear reactions, Spectra, Tables, Two-dimensional calculations.

For abstract, see NSA 28 07, number 15617.

UNI-35/GA PC$4.50/MF$1.45
United Nuclear Industries, Inc., Richland, Wash. (Usa).
UNIVAC 1108 HAMMER-HANFORD VERSION SUPPLEMENTARY USERS NOTE.
H. Toffer. 20 Jun 73, 48p
Contract AT(45-1)-1857

Descriptors: (*Computer codes, *H codes), (*Neutron reactions, *Cross sections), (*Neutron beams, *Nuclear reactions), Fortran, Univac computers.

For abstract, see NSA 28 08, number 19800.

UR-3055-5/GA PC$12.75/MF$1.45
Rochester Univ., N. Y.
MEASUREMENT OF EXP 3 HE-- EXP 9 BE NEUTRON SPECTRA AND YIELDS BY PULSED BEAM TIME-OF-FLIGHT TECHNIQUES AND THEIR RADIOBIOLOGICAL APPLICATIONS.
B. R. Gifford. 1972, 215p
Contract AT(11-1)-3055

Descriptors: (*Beryllium 9, *Helium 3 reactions), (*Helium 3 beams, *Nuclear reactions), (*Liquid scintillation detectors, *Efficiency), (*Neutron detection, Liquid scintillation detectors), Angular distribution, Energy spectra, Mev range 10-100, Neutron spectra, Neutrons, Nuclear reaction yield, Nuclear temperature, Electrons, Mev range 01-10, Protons, Stopping power.

For abstract, see NSA 28 07, number 16867.

UUIP-805/GA PC$3.75/MF$1.45
Uppsala Univ. (Sweden). Inst. Of Physics.
DECAY OF EXP 190 AU.
A. Johansson, and B. Nyman. Feb 73, 31p
U.S. Sales Only.

Descriptors: (*Gold 190, *Beta-plus decay), (*Platinum 190, *Energy-level transitions), Beta spectra, Electron capture decay, Electrons, Energy levels, Flat magnetic spectrometers, Gamma spectra, Internal conversion, K conversion, Li-drifted ge detectors, Multipolarity, Parity, Photons, Positrons, Q-value, Spin.

For abstract, see NSA 28 07, number 17026.

UUIP-806/GA PC$4.00/MF$1.45
Uppsala Univ. (Sweden). Inst. Of Physics.
EXCITED STATES IN EXP 103 PD STUDIED THROUGH THE EXP 103 RH(P,N GAMMA) AND EXP 103 RH(D,2N GAMMA) REACTIONS AND THE EXP 103 AG DECAY.
B. Nyman, W. Dietrich, A. Johansson, C. O. Lannergard, and A. Baecklin. Mar 73, 37p
U.S. Sales Only.

Descriptors: (*Palladium 103, *Energy levels), Coincidence methods, Deuteron beams, Excited states, Ft value, Multipolarity, On-line measurement systems, Parity, Proton beams, Rhodium 103, Spin.

For abstract, see NSA 28 08, number 19906.

UUIP-816/GA PC$3.00/MF$1.45
Uppsala Univ. (Sweden). Inst. Of Physics.
TRANSITION RATES IN EXP 97 TC.
C. Bergman, B. Svahn, L. G. Svensson, A. Baecklin, and J. Lindskog. Mar 73, 14p
U.S. Sales Only.

Descriptors: (*Technetium 97, *Energy-level transitions), Coincidence methods, Decay, Electrons, Internal conversion, Lifetime, Rubidium 97, Spectroscopy.

For abstract, see NSA 28 08, number 19907.

20I. Plasma Physics

AD-768 526/6GA Reprint
California Univ Los Angeles Dept of Physics
MAGNETIC MULTIPOLE CONTAINMENT OF LARGE UNIFORM COLLISIONLESS QUIESCENT PLASMAS,
Rudolf Limpaecher, and Kenneth R. MacKenzie. 18 Dec 72, 8p AFOSR-TR-73-1786
Grant AF-AFOSR-2445-73
Availability: Pub. in Review of Scientific Instruments, v44 n6 p726-731 Jun 73.

Descriptors: (*Plasma medium, Containment), Magnetic fields, Magnets, Electron density, Ions.

The principle of plasma confinement by magnetic walls originated with the fusion effort, where some large devices use multipole orders up to the octopole. For confinement studies a multipole device described by Sadowski uses a spherical arrangement of 32 electromagnets. The multipole principle, however, has apparently not been applied to the problem of containment of a large volume quiescent uniform plasma for basic studies in plasma physics. In the paper the authors report the characteristics of two such uniform plasmas in essentially zero magnetic field contained by a multipole field created by small permanent magnets.

AD-768 548/0GA Reprint
Michigan Univ Ann Arbor Dept of Aerospace Engineering
THE EFFECT OF TEMPERATURE PERTURBATIONS ON ION-ACOUSTIC AND DRIFT WAVES IN A WEAKLY COLLISIONAL PLASMA,
R. S. B. Ong, and M. Y. Yu. 25 Oct 72, 13p
AFOSR-TR-73-1932
Grant AF-AFOSR-2224-72
Revision of report dated 29 Jun 72.
Availability: Pub. in Plasma Physics, v15 p659-668 1973.

Descriptors: (*Plasma medium, Kinetic theory), Electron density, Temperature, Perturbation theory, Stability.
Identifiers: Ion acoustic waves, Electron ion interactions, Electron energy.

The influence of temperature perturbations on the propagation and stability of low frequency waves in a weakly collisional plasma is analyzed. Temperature oscillations in general reduce the stability of ion acoustic waves. It also tends to lower the magnitude of the critical current necessary for triggering the instability. In the case of drift waves its effect is to change the destabilizing role of electron-ion collisions in the isothermal model into a damping influence. (Author)

AD-768 549/8GA Reprint
Michigan Univ Ann Arbor Dept of Aerospace Engineering
SHIELDING OF A SLOW TEST CHARGE IN A COLLISIONAL PLASMA,
L. Stenflo, M. Y. Yu, and P. K. Shukla. 13 Mar 72, 6p AFOSR-TR-73-1935
Grant AF-AFOSR-2224-72
Availability: Pub. in The Physics of Fluids, v16 n3 p450-452 Mar 73.

Descriptors: (*Plasma medium, Space charges), Electron density, Interactions, Shielding.

The potential of a slowly moving test charge is considered. Collisional effects are described by a simple BGK model as well as a Lorentz model. It is found that the far-field potential may fall off as the inverse square of distance when the collision frequency is larger than the plasma frequency. (Author)

AD-768 553/0GA Reprint
California Univ Los Angeles Plasma Physics Group
ENERGETIC ION BEAM SOURCE AND FREE-STREAM BEAM DIAGNOSTIC TECHNIQUES,
Reiner L. Stenzel, and Barrett H. Ripin. 22 Jan 73, 8p Rept no. PPG-134 AFOSR-TR-73-1785
Grant AF-AFOSR-2332-72
Revision of report dated 9 Nov 72.
Availability: Pub. in Review of Scientific Instruments, v44 n5 p617-621 May 73.

Descriptors: (*Plasma medium, Stability), (*Ion beams, Plasma medium), Magnetic fields, Dispersion relations, Radiofrequency.
Identifiers: Plasma instabilities, Nuclear fusion, Plasma diagnostics.

A steady state, dc discharge, electrostatically focused ion beam source with permanent magnet multipole confinement is described. The ion beam is low density, (n sub b) about 50 to the 8th power/cc, low divergence, theta about one degree, energetic, (V sub b) < or = 5 kV, and is suitable for investigating ion beam-plasma interactions. Ion beam speed and species are determined either by modulating the beam and analyzing the resulting free-streaming perturbations or by a pulse and time-of-flight technique. The amplitude of the free-streaming signal is enhanced in the electron cyclotron harmonic passbands due to the decreased dielectric function of the background plasma. Two beam-plasma instabilities, the electron drift instability, and an instability at the lower hybrid frequency are observed using this ion source. (Author)

AD-768 596/9GA PC$3.00/MF$1.45
Massachusetts Inst of Tech Cambridge Dept of Aeronautics and Astronautics
KINETIC THEORY OF UNSTABLE PLASMAS FOR THERMONUCLEAR POWER.
Final scientific rept.,
J. E. McCune. May 73, 7p AFOSR-TR-73-1634
Grant AF-AFOSR-1697-69

Descriptors: (*Plasma medium, Kinetic theory), Electron beams, Stability, Transport properties, Lasers, Scientific research.
Identifiers: Nuclear fusion, Magnetic mirrors, Laser produced plasmas.

The document contains a brief review of progress made in a study of the interaction of an intense electron beam with a dense plasma. (Modified author abstract)

AD-768 597/7GA PC$3.00/MF$1.45
California Univ Los Angeles School of Engineering and Applied Science
OPTIMAL CONFINEMENT OF COLLISIONLESS PLASMAS BY LOCALIZED TIME-VARYING ELECTRIC FIELDS,
P. K. C. Wang. Jul 73, 37p Rept no. UCLA-ENG-7353 AFOSR-TR-73-1633
Grant AF-AFOSR-2303-72

Descriptors: (*Plasma medium, Confinement), (*Electric fields, Plasma medium), Partial differential equations, Nonlinear differential equations, Electron density, Feedback, Numerical analysis, Theorems.
Identifiers: Plasma control, Computerized simulation, Time varying systems, Nuclear fusion, Feedback control.

The problem of optimal confinement of collisionless plasmas by means of external amplitude-limited time-varying electric fields localized to an

outer layer enclosing the confinement region (a specified closed bounded spatial domain) is considered. To confine the plasma, the external electric field (control) establishes a finite potential barrier for the escaping particles. The field direction for confinement depends on the sign of the electrical charge of the escaping particles inside the layer. The paper begins with a formal development of the plasma equations. Then, the existence and uniqueness of solutions of these equations are established. This is followed by the formulation of the optimal confinement problem along with a discussion of the existence of an optimal electric field (control). By introducing additional assumptions to simplify the problem, suboptimal feedback controls are obtained. Finally, the effectiveness of the derived feedback controls is determined numerically using a computer-simulated plasma. (Author)

AD-768 598/5GA PC$3.75/MF$1.45
Rensselaer Polytechnic Inst Troy N Y Plasma Dynamics Lab
COMPARISON OF ION BEAM PROBE AND LANGMUIR PROBE DIAGNOSTIC TECHNIQUES.
Master's thesis,
John C. Glowienka. Jul 73, 97p Rept no. RPDL-73-2 AFOSR-TR-73-1632
Grant AF-AFOSR-2191-72

Descriptors: (*Plasma medium, Magnetic pinch), (*Probes(Electromagnetic), Performance(Engineering)), Langmuir probes, Ion beams, Electron density, Thermonuclear reactions, Gas discharges, Theses.
Identifiers: *Plasma diagnostics, Nuclear fusion, Electron energy.

The report concerns the comparison of two diagnostic techniques for magnetically confined plasmas - the Langmuir probe technique and the ion beam probe technique. The comparison is made for plasma charged particle number density and plasma electron temperature measurements on the Rensselaer hollow cathode discharge. The principles, theory, and system description required to understand and operate each probe are discussed. Experimental results taken with each device on the same plasma are given and compared. It is found that one or both techniques need to be extended for a more valid comparison. Work towards a more sensitive ion beam probe is mentioned with this comparison in mind. In addition, the application of the ion beam probe to a study of a plasma with a coherent instability and the feedback stabilization of the instability is discussed. (Author)

AD-768 599/3GA PC$8.00/MF$1.45
Rensselaer Polytechnic Inst Troy N Y Plasma Dynamics Lab
FEEDBACK STABILIZATION TECHNIQUES FOR LOW FREQUENCY INSTABILITIES IN THE HOLLOW-CATHODE ARC.
Doctoral thesis,
John H. Stufflebeam. May 73, 118p Rept no. RPDL-73-1 AFOSR-TR-73-1635
Grant AF-AFOSR-2191-72

Descriptors: (*Plasma medium, Stability), Gas discharges, Langmuir probes, Feedback, Electron density, Ions, Curve fitting, Graphics, Theses, Remote control systems, Argon.
Identifiers: *Plasma instabilities, Plasma control, Q machines, Ion acoustic waves, Electron energy, Plasma diagnostics, Argon plasma, Feedback control.

The report describes research in the area of remote control of plasma instabilities by the technique of feedback stabilization. A theoretical analysis is developed to describe the physical mechanisms of the instability. Inclusion of a term representative of the feedback suppressor signal shows control of the initial growth rate of the oscillation. A non-linear analysis predicts the observed variations of instability amplitude when the system is perturbed by the feedback system. The experimental investigation was performed on a hollow-cathode arc discharge in argon. (Modified author abstract)

AD-768 626/4GA PC$8.00/MF$1.45
Magnetic Corp of America Cambridge Mass
SUPERCONDUCTING MAGNETOHYDRODYNAMIC MAGNET COMPREHENSIVE TESTING.
Interim technical rept. Aug 72-Apr 73,
Zdenek J. J. Stekly, and Richard J. Thome. Sep 73, 120p Rept no. MCAD-27 AFAPL-TR-73-44
Contract F33615-72-C-2069

Descriptors: (*Magnetohydrodynamics, *Electromagnets), Superconductors, Magnet coils, Winding, Design, Tests.
Identifiers: *Superconducting magnets.

Extensive tests have been performed on a lightweight, high current density superconducting MHD magnet. The system bore is 0.21 m in diameter and the uniform field length (5%) is 0.88 m. During the tests, central and maximum fields of 3.9 and 5.46 Wb/square meters respectively were attained at an overall winding current density of 1.2 x 10 to the 8th power A/square meters. Operating characteristics were studied while rapidly charging and discharging the coil (times of the order of minutes). Information on load distribution in the magnet structural components was generated using a system of strain gauges with computer aided data reduction. Test results led to structural modifications which improved performance and suggest other areas where alterations may be desirable. (Author)

AD-768 792/4GA PC$4.50/MF$1.45
Technische Universitaet Munich (West Germany) Elektrophysikalisches Institut
AIR PLASMA PROPERTIES AT HIGH TEMPERATURES.
Final rept.,
H. Maecker. Nov 73, 47p ARL-73-0150
Grant AF-AFOSR-2280-72

Descriptors: (*Plasma physics, Air), Electric arcs, Electron density, Circuits, Spectrum analyzers, Gas flow, Curve fitting, Graphics, West Germany, Nitrogen, Oxygen, Hydrogen, Carbon dioxide.
Identifiers: Electron energy.

In order to investigate the properties of air mixtures and related gases cascade arc chambers of 5 mm diam. are fed with the gas desired. Careful measurements of the field strength E and the total radiation U depending on current and gas composition were carried out. An apparatus for spectroscopic temperature measurements with evaluation by computer technique on-line was installed. Temperature measurements were performed. For the special case of hydrogen, viscosity measurements done. In the spectrum of an oxygen arc burning in a quartz tube at low currents the affinity continuum due to attachment of free electrons to neutral oxygen atoms could be found and measured whereby the affinity energy could be determined. (Modified author abstract)

AD-769 025/8GA Not available NTIS
Victoria Univ (British Columbia) Dept of Physics
THE EFFECT OF IONIZATION AND FLOW VELOCITY UPON SPARK GAP RECOVERY,
R. M. Clements, and P. R. Smy. 4 Jan 73, 15p
DRB-Reprint-3816
Prepared in cooperation with Alberta Univ., Edmonton.
Availability: Pub. in Jnl. of Physics D: Applied Physics, v6 p1253-1265 1973.

Descriptors: (*Gas ionization, Electric arcs), (*Circuit breakers, *Sparks), Cathodes, Electron density, Transients.
Identifiers: *Dielectric breakdown.

Breakdown measurements for a small cylindrical cathode in an atmospheric-pressure flowing plasma of variable ionization (between 10 to the 15th power and 10 to the 18th power/cubic meter) are reported for both DC voltages and fast-rise pulses (rise time 0.16 microseconds) applied to the cathode. For these measurements the breakdown voltages are found to be reduced to as little as 1/6 of the breakdown voltage with no ionization. The measurements agree reasonably well with a theoretical model in which the anode is not the positive electrode in the plasma, but rather the edge of the coaxial sheath which surrounds the cathode, with breakdown voltages being given by the well-known breakdown relation for coaxial gaps. (Modified author abstract)

AD-769 077/9GA PC$3.00/MF$1.45
Science Applications Inc La Jolla Calif
THEORETICAL STUDY OF NON-LTE PROCESSES IN LASER HEATED PLASMAS.
Final rept. 15 Jun 73-14 Jun 73,
Stephen Tamor. Oct 73, 46p Rept no. SAI-73-545-LJ DNA-3175F
Contract DNA001-72-C-0215

Descriptors: (*Plasma medium, Heating), (*Lasers, Plasma medium), Reaction kinetics, Matrix algebra, Integrals, X rays, Numerical analysis.
Identifiers: *Plasma heating, Neon plasma, Electron ion interactions, Collisional energy transfer, Computer aided analysis.

The development of a code for calculating the non-LTE kinetics of the excitation and ionization of a laser heated plasma, and prediction of the emitted x-ray spectrum is described. This code is intended to be used for exploratory studies in which x-ray conversion efficiencies for various densities, compositions, temperature profiles, etc., are calculated. To carry out such computations rate coefficients for all possible transitions must be available. A simple method of calculating these rates is derived. Since numerous runs involving a wide range of parameter choices is envisaged it is desired that the basic time step in the integration be very large. The resulting problem of stiffness of the rate equations and methods of overcoming it are discussed. Preliminary results for a neon plasma are presented. (Author)

AD-769 102/5GA Reprint
California Univ Los Angeles Dept of Physics
NONLINEAR STABILIZATION OF OSCILLATING TWO-STREAM INSTABILITY,
K. Nishikawa, Y. C. Lee, and P. K. Kaw. 16 Feb 73, 3p
Contracts N00014-69-A-0200-4023, F44620-70-C-0033
Prepared in cooperation with Navrangpura, Ahmedaband (India). Physical Research Lab. Sponsored in part by Contract AT(04-3)-34 and Grant NSF-GP-222817. Revision of report dated 25 Sep 72.
Availability: Pub. in The Physics of Fluids, v16 n8 p1380-1381 Aug 73.

Descriptors: (*Plasma oscillations, Stability), Electron density, Kinetic energy, Damping, Nonlinear systems.
Identifiers: Plasma frequency.

It is shown that the basic nonlinear effect associated with the oscillating two-stream instability is a downshift of the natural frequencies of electron plasma waves. As a result, conversion of this instability to a decay instability can take place. (Author)

CEA-CONF-2316/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
ENERGY PRINCIPLE FOR PLASMA STABILITY AGAINST LOW FREQUENCY ELECTROSTATIC MOTIONS.
J. Andreoletti. 1p CONF-730446-1

Descriptors: (*Plasma instability, *Electrostatic waves), Charged particles, Collisionless plasma, Distribution functions, Magnetic fields, Trapped-particle instability.

For abstract, see NSA 28 07, number 17202.

CEA-CONF-2317/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.
LOCALIZED CRITERIA OF STABILITY IN MHD.
C. Mercier. 1972, 19p CONF-730446-2
U.S. Sales Only.

Descriptors: (*Plasma macroinstabilities, *Toroidal configuration), (*Tokamak devices, Plasma macroinstabilities), Disturbances, Magnetic fields, Magnetohydrodynamics.

For abstract, see NSA 28 07, number 17203.

COM-73-11758/2GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Space Environment Lab.
ON THE RECONNECTION OF MAGNETIC FIELD LINES IN COMPRESSIBLE CONDUCTING FLUIDS,
Tyan Yeh, and Murray Dryer. 11 Dec 72, 16p
NOAA-73092705
Pub. in the Astrophysical Jnl., v182 n1 p301-315, 15 May 73.

Descriptors: (*Magnetohydrodynamics, Compressible flow), Plasmas(Physics), Partial differential equations.

A previous study by Yeh and Axford of the reconnection of magnetic field lines in an incompressible fluid is extended to a compressible fluid. From hydromagnetic flows in similarity form, it is found that expansion takes place before the reconnection and compression after the reconnection. The pressure gradient in the radial direction causes the field lines to bend into separatrices in the incoming flows. The kinks on the reconnected field lines propagate out as slow-mode hydromagnetic shocks in the outgoing flows. In the expansion phase of the merging the magnetic energy is piled up around the separatrices, and then in the compression phase the energy is coverted from magnetic into kinetic and thermal. (Author)

COM-73-11774/9GA Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Space Environment Lab.
NONLINEAR DEVELOPMENT AND FOURIER ANALYSIS OF THE WHISTLER MODE INSTABILITY,
S. Cuperman, and Y. Salu. 29 Sep 72, 17p NOAA-73092711
Contract NOAA-1-35120
Prepared in cooperation with Tel-Aviv Univ., Ramat Aviv (Israel).
Pub. in Jnl. of Plasma Physics, v9 pt3 p295-310 1973.

Descriptors: (*Whistlers, *Plasmas(Physics)), Computerized simulation, Magnetic fields, Fourier analysis, Magnetosphere.

The paper reports an investigation, made with the aid of computer simulation, on the development of the whistler mode instability through all its stages of evolution, for the case of a hot anisothermal electron plasma embedded in a static magnetic field. Special emphasis was placed on the identification of the enhanced wave activity as the predicted whistler waves (electromagnetic, electron-like polarized), the determination of the instability range in the k space, the location of the maximum rate of growth and their comparison with the theoretical predictions, the detailed analysis and evolution of the various instability modes through all their evolutionary stages, and the dynamical interaction between the waves and the particles in the system which is essential for the quasi-final state of the system.

CONF-730710-/GA PC$5.45/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
PROCEEDINGS OF THE SIXTH CONFERENCE ON NUMERICAL SIMULATION OF PLASMAS, LAWRENCE BERKELEY LABORATORY, UNIVERSITY OF CALIFORNIA/BERKELEY, CALIFORNIA, JULY 16--18, 1973.
1973, 89p
Contract W7405-eng-48

Descriptors: (*Plasma simulation, *Meetings), Magnetohydrodynamics.

For abstract, see NSA 28 08, number 20078.

COO-3632-10/GA PC$3.25/MF$1.45
Dartmouth Coll., Hanover, N. H.
SCATTERING IN A STABLE BEAM-PLASMA SYSTEM.
C. J. Diaz, J. R. Conrad, and J. E. Walsh. 1973, 23p
Contract AT(11-1)-3632

Descriptors: (*Beam-plasma systems, *Scattering), Dispersion relations, Distribution, Fokker-planck equation, Ions, Prigogine theorem, Relaxation, Velocity.

For abstract, see NSA 28 07, number 17172.

COO-3632-11/GA PC$4.25/MF$1.45
Dartmouth Coll., Hanover, N. H.
NONLINEAR CONTROL OF TURBULENCE AND VELOCITY SPACE DIFFUSION IN BEAM PLASMA SYSTEMS. PROGRESS REPORT, SEPTEMBER 14, 1972--JUNE 14, 1973.
J. E. Walsh, J. R. Conrad, C. J. Diaz, K. B. Freese, and G. L. Hoffman. 14 Jun 73, 45p
Contract AT(11-1)-3632

Descriptors: (*Beam-plasma systems, *Research programs), Electron temperature, Nonlinear problems, Plasma heating, Plasma waves, Turbulence, Velocity.

For abstract, see NSA 28 07, number 17173.

COO-3632-9/GA PC$3.50/MF$1.45
Dartmouth Coll., Hanover, N. H.
SPECTRUM OF ELECTROSTATIC FIELD FLUCTUATIONS IN A BOUNDED BEAM PLASMA SYSTEM.
C. J. Diaz, J. E. Walsh, and J. R. Conrad. 1973, 27p
Contract AT(11-1)-3632

Descriptors: (*Beam-plasma systems, *Electrostatic waves), Dispersion relations, Oscillations, Spectra, Variations.

For abstract, see NSA 28 07, number 17231.

FRNC-TH-364/GA PC$13.25/MF$1.45
Rouen Univ. (France). Faculte des Sciences.
STUDY OF RADIATIONS IN PLASMAS.
G. Piar. 1972, 223p
In French. U.S. Sales Only.

Descriptors: (*Laser-produced plasma, *Impurities), (*Plasma diagnostics, *Electron temperature), Plasma, Argon, Auger effect, Boundary layers, Emission spectroscopy, Gas flow, Ion density, Plasma sheath, Pressure dependence, Recombination, Wind tunnels, Deuterium, Inhomogeneous plasma, Interactions, Laser radiation, Neutrons, Photon beams, Solids, Thermonuclear reactions.

For abstract, see NSA 28 07, number 17192.

FRNC-TH-365/GA PC$11.25/MF$1.45
Rouen Univ. (France). Faculte des Sciences.
IONIZATION KINETICS OF AN ARGON PLASMA CREATED BY A SHOCK WAVE.
G. Larcher. 1972, 184p
In French. U.S. Sales Only.

Descriptors: (*Plasma production, *Shock waves), Argon, Atoms, Collisions, Cross sections, Electron density, Electron temperature, Electrons, Emission spectroscopy, Energy losses, Equilibrium, Excitation, Ionization, Plasma, Plasma diagnostics, Reaction kinetics, Relaxation, Shock tubes, Time dependence, Velocity.

For abstract, see NSA 28 07, number 17193.

FRNC-TH-369/GA PC$12.25/MF$1.45
Paris Univ., Orsay (France).
INSTABILITY OF AN IONIZATION WAVE IN A PLASMA EXCITED AT ONE OF ITS H-F RESONANCES.
A. Peyre. 1972, 205p
In French. U.S. Sales Only.

Descriptors: (*Plasma waves, *Ionization), Dispersion relations, Electric discharges, Electric fields, Emission, Ghz range 01-100, Khz range 01-100, Medium vacuum, Plasma, Resonance, Striations, Xenon.

For abstract, see NSA 28 07, number 17232.

FRNC-TH-375/GA PC$7.50/MF$1.45
Paris Univ., Orsay (France).
STUDY OF ELECTRON-ION RECOMBINATION MECHANISM IN THE VAPOR OF IONIZED CS.
G. Saint-Hilaire. 1972, 110p
In French. U.S. Sales Only.

Descriptors: (*Plasma, *Recombination), (*Cesium, Recombination), Afterglow, Collisions, Electron temperature, Electrons, High-frequency heating, Ions, Medium vacuum, Pressure dependence.

For abstract, see NSA 28 08, number 20070.

IPP-IV-46/GA PC$3.25/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching (West Germany).
EVIDENCE OF STIMULATED BACKSCATTERING OF LASER RADIATION FROM A LASER PRODUCED PLASMA.
K. Eidmann, and R. Sigel. Dec 72, 22p CONF-721099-1
U.S. Sales Only.

Descriptors: (*Laser-produced plasma, *Backscattering), Deuterium, Laser radiation, Reflection.

For abstract, see NSA 28 08, number 20085.

IPP-2/212/GA PC$3.50/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching (West Germany).
STATIONARY CONVECTION IN TOROIDAL PLASMA CONFIGURATIONS.
H. Wobig. Mar 73, 29p
U.S. Sales Only.

Descriptors: (*Plasma, *Magnetohydrodynamics), Atoms, Convection, Differential equations, Interactions, Magnetic fields, Neutral particles, Shear.

For abstract, see NSA 28 07, number 17174.

ITF-72-153-E/GA PC$3.00/MF$1.45
Akademiya Nauk Ukrainskoi SSR, Kiev. Institut Teoreticheskoi Fiziki.
FIVE WAVE INTERACTION: A POSSIBILITY FOR ENHANCEMENT OF OPTICAL OR MICROWAVE RADIATION BY NONLINEAR COUPLING BY EXPLOSIVELY UNSTABLE PLASMA WAVES.
H. Wilhelmsson, and V. P. Pavlenko. 1972, 19p
U.S. Sales Only.

Descriptors: (*Plasma waves, *Coupling), Electromagnetic radiation, Interactions, Microwave radiation, Nonlinear problems.

For abstract, see NSA 28 08, number 20122.

LA-DC-72-1113/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
U. S. AEC LASER-FUSION PROGRAM.
K. Boyer. 1972, 14p CONF-721099-2

Descriptors: (*Laser-produced plasma, *Research programs), Lasers, Reviews, Us aec.

For abstract, see NSA 28 08, number 20086.

LA-5149/GA PC$4.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
SOME FACTORS BEARING ON THE DECAY AND REVERSAL OF THE PLASMA CURRENT IN Z PINCHES.
G. P. Boicourt. Jun 73, 2p
Contract W-7405-eng-36

Descriptors: (*Pinch effect, *Electric currents), Electric conductivity, Electronic circuits, Induction, Plasma, Switches.

For abstract, see NSA 28 07, number 17159.

LFEN-150-a/GA PC$4.00/MF$1.45
Junta de Energia Nuclear, Sacavem (Portugal). Laboratorio de Fisica E Engenharia Nucleares.
ATOMIC PROCESSES IN A POSITIVE COLUMN OF MERCURY VAPOR. DETERMINATION OF SOME PARAMETERS.
M. R. Teixeira. 1973, 39p
In Portuguese. U.S. Sales Only.

Descriptors: (*Mercury, *Electric discharges), Absorption, Atoms, Cross sections, Electron density, Electron temperature, Energy levels, Excited states, Lifetime, Visible radiation.

For abstract, see NSA 28 07, number 17781.

MATT-Trans-108/GA PC$3.75/MF$1.45
Akademiya Nauk Sssr, Novosibirsk. Institut Yadernoi Fiziki.
EXPERIMENTS IN CONFINING A PLASMA IN A MULTIMIRROR MAGNETIC TRAP.
G. I. Budker, V. V. Danilov, E. P. Kruglyakov, D. D. Ryutov, and E. V. Shun'ko. 1973, 32p
Translation of IYAF--22-73.

Descriptors: (*Plasma, *Confinement), (*Magnetic mirrors, Confinement), Alkali metals, Cold plasma.

For abstract, see NSA 28 08, number 20054.

MATT-896/GA PC$3.00/MF$1.45
Princeton Univ., N. J. Plasma Physics Lab.
BPERP, BSLANT, AND GLOBE: OPTIMIZED CODES FOR THE SIMULATION OF PLASMAS IN A STATIC UNIFORM MAGNETIC FIELD.
B. Rosen, H. Okuda, and L. G. Di Massa. Jun 72, 14p
Contract AT(11-1)-3073

Descriptors: (*Plasma simulation, *Computer codes), Algorithms, B codes, G codes, Magnetic fields.

For abstract, see NSA 28 07, number 17175.

N-73-18724/GA PC$4.00/MF$1.45
California Univ., Los Angeles. Plasma Physics Group.
FORMATION OF ION ACOUSTIC SHOCKS.
R. B. White, B. D. Fried, and F. V. Coroniti. Jan 73, 19p NASA-CR-130994, PPG-142
Contract N00014-69-A-0200-4023

Descriptors: (*Plasma waves, *Shock waves), Cold plasma, Ion acoustic waves, Shock tubes.

For abstract, see NSA 28 08, number 20071.

N-73-18725/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
PERFORMANCE OF AN ION-CYCLOTRON-WAVE PLASMA APPARATUS OPERATED IN THE RF SUSTAINED MODE.
C. C. Swett, and R. R. Woollett. Mar 73, 43p NASA-TN-D-7187

Descriptors: (*Plasma waves, *Cyclotron frequency), Ions, Magnet coils, Performance, Radiowave radiation, Wave propagation.

For abstract, see NSA 28 08, number 20124.

N-73-18733/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
DOUBLE ELECTROSTATIC PROBE FOR MEASURING DENSITY, TEMPERATURE, AND VELOCITY OF A FLOWING PLASMA.
D. L. Chubb. Mar 73, 22p NASA-TN-D-7223

Descriptors: (*Plasma diagnostics, Electric probes), (*Electric probes, *Plasma density), Argon, Electron temperature, Electrostatics, Linear momentum, Mach number, Velocity.

For abstract, see NSA 28 08, number 20060.

NP-19826/GA PC$3.00/MF$1.45
Scientific Research Inst. Of Electro-Physical Apparatus, Leningrad (Ussr).
ONE POSSIBILITY OF MULTIFRAME HOLOGRAPHING OF MICROSECOND PROCESSES WITH SYNCHRONIZATION BY SIGNALS FROM INVESTIGATED PROCESSES.
A. G. Smirnov, V. G. Smirnov, and D. I. Stasel'ko. 1972, 9p
In Russian. U.S. Sales Only.

Descriptors: (*Plasma diagnostics, *Holography), Laser radiation, Signals.

For abstract, see NSA 28 08, number 20061.

N73-30694/6GA PC$4.00/MF$1.45
Stanford Univ., Calif. Inst. for Plasma Physics.
A THEORY FOR SCATTERING BY DENSITY FLUCTUATIONS BASED ON THREE-WAVE INTERACTION.
K. J. Harker, and F. W. Crawford. Jun 73, 38p NASA-CR-133808, SUIPR-517
Contracts NGL-05-020-176, N00014-67-A-0112-0066

Descriptors: *Charged particles, *Magnetic fields, *Scattering, Electromagnetic radiation, High frequencies, Plasma oscillations.

For abstract, see STAR 1121

N73-30695/3GA PC$3.00/MF$1.45
California Univ., Los Angeles.
THEORETICAL STUDY OF NONLINEAR WAVES AND SHOCK-LIKE PHENOMENA IN HOT PLASMAS.
Final Report.
B. D. Fried, A. Banos, Jr., and C. F. Kennel. 29 May 73, 9p NASA-CR-132808
Contract NGL-05-007-116

Descriptors: *High temperature plasmas, *Plasma waves, *Shock waves, Excitation, Magnetic fields, Magnetosphere, Plasma physics, Solar wind, Temperature gradients.

For abstract, see STAR 1121

N73-30696/1GA PC$5.25/MF$1.45
Boeing Aerospace Co., Seattle, Wash. Research and Engineering Div.
ACTIVE CLEANING TECHNIQUE DEVICE.
R. L. Shannon, and R. B. Gillette. Mar 73, 64p NASA-CR-124335, D180-15454-1
Contract NAS8-28270

Descriptors: *Cleaning, *Models, Contamination, Direct current, Radio frequencies, Surface properties.

For abstract, see STAR 1121

N73-31242/3GA PC$4.25/MF$1.45
Kyoto Univ. (Japan). Dept. of Aeronautical Engineering.
POPULATION DENSITY PROFILES IN A SOURCE FLOW EXPANSION OF A PARTIALLY IONIZED ARGON.
A. Kimura, K. Teshima, and M. Nishida. Sep 73, 43p C-37

Descriptors: *Argon, *Density distribution, *Gas expansion, *Ionized gases, *Jet flow, *Mathematical models, Atomic excitations, Radiative transfer.

For abstract, see STAR 1122

N73-31403/1GA PC$8.00/MF$1.45
Tokyo Univ. (Japan). Inst. of Space and Aeronautical Science.
THE GYRO PLASMA PROBE ONBOARD THE REXS-DENPA SATELLITE.
M. Ejiri, H. Oya, T. Aso, C. Morita, and T. Obayashi. Jul 73, 116p ISAS-495-VOL-38-NO-6

Descriptors: *Impedance probes, *Plasma flux measurements, *Plasma probes, *Telemetry, Equipment specifications, Extraterrestrial radiation, Test equipment.

For abstract, see STAR 1122

N73-31648/1GA PC$3.75/MF$1.45
Techtran Corp., Glen Burnie, Md.
THE WENDELSTEIN W 7 PROJECT.
G. H. Wolf. Sep 73, 31p NASA-TT-F-15111, IPP-2/213
Contract NASW-2485
Tran-Transl. Into English of ''Das Projekt Wendelstein W 7', Max-Planck-Inst. Fuer Plasmaphys., Garching, West Germany, Report Ipp-2/213, Apr. 1973 42 p.

Descriptors: *High temperature plasmas, *Plasma control, *Stellarators, Particle acceleration, Plasma generators, Superconductors.

For abstract, see STAR 1122

N73-31649/9GA PC$8.75/MF$1.45
Technische Universitaet, Brunswick (West Germany). Fakultaet fuer Naturwissenschaftliche.
RESEARCH ON KINETIC REACTIONS OF PERSISTENT PLASMAS IN STATIONARY STREAMING NITROGEN-HELIUM MIXTURE REAKTIONSKINETISCHE UNTERSUCHUNGEN AN NACHLEUCHTPLASMEN STATIONAER STROEMENDER STICKSTOFF-HELIUM-GEMISCHE.
Ph.D. Thesis.
W. Zwirner. 1972, 132p
Language in German.

Descriptors: *Gas flow, *Plasma dynamics, *Plasma interactions, *Plasma layers, Chemical reactions, Equipment specifications, Plasma probes, Test equipment.

For abstract, see STAR 1122

N73-31650/7GA PC$3.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.

GENERAL CHARACTERISTICS OF HEAVY ION PLASMA CREATED BY LASER.
G. Tonon. Sep 73, 24p NASA-TT-F-15132, CEA-CONF-2022
Tran-Transl. Into English of "Caracteristiques Generales des Plasmas d'Ions Lourds Cree Par Laser", Cea, Villeneuve-Saint-Georges, France, Report Cea-Conf-2022, 1972 28 p. Subm-Sponsored by NASA. Conf-Presented at Conf. On the Sources of Multi-Charge Ions, Paris, 1972.

Descriptors: *Heavy ions, *Laser outputs, *Plasmas (Physics), Energy distribution, Matter (Physics).

For abstract, see STAR 1122

N73-31651/5GA PC$5.25/MF$1.45
California Univ., Los Angeles. Dept. of Physics.
TURBULENCE IN ELECTROSTATIC ION ACOUSTIC SHOCKS.
R. W. Means, F. V. Coroniti, A. Y. Wong, and R. B. White. May 73, 61p NASA-CR-135490, PPG-149
Contracts NGL-05-007-190, N00014-69-A-0200-4023

Descriptors: *Ion acoustic waves, *Plasma generators, *Shock wave propagation, *Turbulence effects, Plasma waves, Wave interaction.

For abstract, see STAR 1122

N73-31660/6GA PC$3.25/MF$1.45
Technische Universitaet, Brunswick (West Germany). Inst. fuer Hochspannungstechnik.
INVESTIGATION OF SWITCHING ELEMENTS FOR ACTIVATION OF HIGH VOLTAGE OSCILLATION CIRCUITS WITH A HIGH Q-FACTOR.
U. Schwarz. Dec 72, 25p BMBW-FB-K-72-32
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
In German; English Summary.

Descriptors: *Electric switches, *Oscillators, *Plasma physics, Circuit breakers, Contact resistance, Foils (Materials), High voltages, Lc circuits, Magnetic fields, Q factors.

For abstract, see STAR 1122

N73-31661/4GA PC$4.00/MF$1.45
Technische Univ., Berlin (West Germany). Sonderforschungsbereich Magnetohydrodynamik.
ANALYTICAL STUDY OF UNCOMPENSATED DC MHD CONVERTERS WITH REGARD TO THE LONGITUDINAL END EFFECT.
T. Schulz. Jun 72, 38p SFB-MHD-6
In German; English Summary.

Descriptors: *Electromagnetic fields, *Magnetohydrodynamic generators, Armatures, Current density, Direct current, Magnetic flux.

For abstract, see STAR 1122

N73-31662/2GA PC$3.75/MF$1.45
Technische Univ., Berlin (West Germany). Sonderforschungsbereich Magnetohydrodynamik.
COMPARISON OF THE LONGITUDINAL END EFFECTS OF CONSTANT AND TRAVELING FIELD MHD CONVERTERS.
T. Schulz. Jun 72, 31p SFB-MHD-7
In German; English Summary.

Descriptors: *Electrodynamics, *Magnetohydrodynamic generators, *Traveling waves, Current density, Electric motors, Magnetic flux, Stators.

For abstract, see STAR 1122

N73-31663/0GA PC$4.25/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany).
THEORETICAL FLOW FIELD ANALYSIS OF AN ANNULAR HALL ACCELERATOR.
K. Robert. 8 Feb 73, 44p DLR-FB-73-45
Contract DFG-RO-320/1
In German; English Summary.

Descriptors: *Coaxial plasma accelerators, *Current density, *Flow velocity, *Hall effect, *Mass distribution, Annular flow, Flow distribution, Perturbation theory, Rarefied plasmas, Subsonic flow, Supersonic flow.

For abstract, see STAR 1122

N73-31664/8GA PC$4.25/MF$1.45
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics and Fusion Research.
PRESSURE DISTRIBUTION AND STABILITY OF A MAGNETIZED PLASMA WITH A NEUTRAL GAS BLANKET.
B. Lehnert. 19 Jun 73, 45p TRITA-EPP-73-12

Descriptors: *Magnetohydrodynamic stability, *Plasma interactions, *Pressure distribution, Beta particles, Magnetic fields, Neutral particles, Permeability, Plasma control, Plasma cylinders, Plasma density, Thermonuclear reactions.

For abstract, see STAR 1122

SC-DC-721508/GA PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
PARAMETRIC CORRELATIONS IN ENERGETIC LASER PLASMAS.
J. N. Olsen, G. W. Kuswa, and E. D. Jones. 1972, 37p CONF-721132-10

Descriptors: (*Laser-produced plasma, *Energy spectra), (*Lithium hydrides, Laser-produced plasma), (*Lithium deuterides, Laser-produced plasma), Emission, Neodymium, Neutrons, X radiation.

For abstract, see NSA 28 07, number 17194.

SC-DC-721536/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
GEOMETRICAL EFFECTS ON THE SOURCE OF SPONTANEOUS LASER-GENERATED MAGNETIC FIELDS.
T. P. Wright, and M. M. Widner. 1972, 8p CONF-721132-11

Descriptors: (*Laser-produced plasma, *Magnetic fields), Geometry, Plasma density, Targets.

For abstract, see NSA 28 07, number 17195.

SLA-73-5352/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
LASER FUSION.
R. E. Palmer. 7p

Descriptors: (*Laser-produced plasma, *Lasers), Carbon dioxide, Focusing, Neodymium, Pulses, Reviews, Thermonuclear reactions.

For abstract, see NSA 28 07, number 17196.

UCID-16293/GA PC$3.75/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
UNFINISHED THEORETICAL PROBLEMS IN MIRROR RESEARCH.
H. L. Berk. 21 May 73, 31p
Contract W-7405-eng-48

Descriptors: (*Baseball devices, Plasma instability), (*2x devices, Plasma instability), (*Plasma instability, *Magnetic mirrors), Confinement, Flute instability, Plasma, Plasma density.

For abstract, see NSA 28 08, number 20097.

UCRL-74815/GA PC$3.00/MF$1.45
California Univ., Livermore. Lawrence Livermore Lab.
PROBLEMS OF THE LASER-AUGMENTED PINCH PROPOSAL.
J. W. Shearer. 18 Jun 73, 4p CONF-730705-11

Descriptors: (*Laser-produced plasma, *Pinch effect), (*Plasma heating, Pinch effect), Confinement, Plasma instability.

For abstract, see NSA 28 08, number 20087.

UCSD-34-P-85-16/GA PC$33.00/MF$1.45
California Univ., la Jolla, San Diego.
THEORETICAL PLASMA PHYSICS RESEARCH. PROGRESS REPORT, 1972--73.
W. B. Thompson. 27 Jun 73, 619p
Contract AT(04-3)-34

Descriptors: (*Plasma, *Research programs), High-frequency heating, Kinetic equations, Plasma drift, Plasma instability, Plasma waves, Resonance.

For abstract, see NSA 28 07, number 17176.

20J. Quantum Theory

AD-768 573/8GA Reprint
Harvard Univ Cambridge Mass Dept of Physics
THE MAXWELL GROUP AND THE QUANTUM THEORY OF PARTICLES IN CLASSICAL HOMOGENEOUS ELECTROMAGNETIC FIELDS,
Robert Schrader. 1972, 36p AFOSR-TR-73-1783
Contract F44620-70-C-0030, Grant NSF-GP-31239
Availability: Pub. in Fortschritte der Physik, v20 p701-734 1972.

Descriptors: (*Quantum mechanics, Charged particles), Electromagnetic fields, Groups(Mathematics), Set theory, Functional analysis, Invariance.
Identifiers: Dirac equation, Klein-Gordon equation, Maxwells equations, Lorentz transformation, Lie algebras.

Covariant solutions of the Dirac (and Klein-Gordon) equations in a homogeneous classical electromagnetic field are constructed. This is done using the symmetry group of the equation, the Maxwell group. These covariant solutions are obtained starting from solutions in the frame where the electromagnetic field is described by a magnetic field pointing in the 3-direction and then using the theory of induced representations. (Author)

AD-768 574/6GA Reprint
Harvard Univ Cambridge Mass Dept of Physics
AXIOM'S FOR EUCLIDEAN GREEN'S FUNCTIONS,
Konrad Osterwalder, and Robert Schrader. 18 Dec 72, 32p AFOSR-TR-73-1782
Contract F44620-70-C-0030, Grant NSF-GP-31239
Availability: Pub. in Communications in Mathematical Physics, v31 p83-112 1973.

Descriptors: (*Quantum mechanics, Green's function), (*Field theory, Green's function), Field theory, Differential geometry, Relativity theory, Theorems.
Identifiers: Axioms, Spinor groups, Quantum field theory, Analytic continuation.

The authors establish necessary and sufficient conditions for Euclidean Green's functions to define a unique Wightman field theory. (Author)

JINR-P2-7116/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.

REDUCTION OF THE PROBLEM OF CALCULATION OF A CLASS OF INFINITE-DIMENSIONAL INTEGRALS IN QUANTUM FIELD THEORY TO THE SOLUTION OF INTEGRAL EQUATION.
L. G. Zastavenko. 1973, 19p
In Russian. U.S. Sales Only.

Descriptors: (*Quantum field theory, *Feynman path integral), Integral equations, Integrals, Perturbation theory, Propagator.

For abstract, see NSA 28 07, number 17286.

JINR-P4-7183/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
THEORY OF PARTICLE REFLECTION BY ONE-DIMENSIONAL POTENTIAL BARRIERS.
V. V. Babikov, and K. K. Musabaev. 1973, 15p
In Russian. U.S. Sales Only.

Descriptors: Particles, Quantum mechanics, Reflection.

For abstract, see NSA 28 07, number 17263.

NP-19796/GA PC$3.75/MF$1.45
Helsinki Univ. (Finland). Research Inst. For Theoretical Physics.
QUANTUM THEORY OF RF RESONANCES: THE SEMICLASSICAL LIMIT.
S. Stenholm. 1973, 33p
U.S. Sales Only.

Descriptors: (*Electromagnetic fields, *Quantum mechanics), (*Atoms, *Interactions), Photons, Radiowave radiation, Resonance.

For abstract, see NSA 28 07, number 17784.

N73-31557/4GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SEPARATION OF VARIABLES IN THE SPECIAL DIAGONAL HAMILTON-JACOBI EQUATION: APPLICATION TO THE DYNAMICAL PROBLEM OF A PARTICLE CONSTRAINED ON A MOVING SURFACE.
D. L. Blanchard, and F. K. Chan. Sep 73, 70p
NASA-TR-R-405, G-1077

Descriptors: *Equations of motion, *Hamilton-jacobi equation, *Relativistic particles, Coordinates, Euclidean geometry, Integral equations, Mathematical models.

For abstract, see STAR 1122

20K. Solid Mechanics

AD-768 416/0GA PC$10.50/MF$1.45
Air Force Materials Lab Wright-Patterson AFB Ohio
DYNAMIC RESPONSE OF MATERIALS TO INTENSE IMPULSIVE LOADING,
Alan K. Hopkins, and Pei Chi Chou. Aug 72, 563p* Library of Congress Catalog Card No. 73-600247.

Descriptors: (*Materials, Loading(Mechanics)), Shock waves, Kinematics, Equations of motion, Stresses, Strain(Mechanics), Elasticity, Plasticity, Viscoelasticity, Equations of state, Difference equations, Hydrodynamics, Impact shock, Composite materials.
Identifiers: Dynamic response, Thermoelasticity, Finite difference theory, Method of characteristics.

The book concerns the dynamic response of materials due to intensive impulsive loadings. The materials considered are primarily solids, although most of the discussions are also applicable to fluids. The loading and response in general happen within a very short time, in the order of microseconds, rather than milliseconds. The duration of the loading, whether mechanical impact or thermodynamic energy input, may sometimes be described in terms of nanoseconds. The magnitude of the loading is such that the initial stress in the material is high, and subsequently decays to moderate values, so that both compressibility and strength effects are important. The book is concerned only with material response, and not with structural response.

AD-768 603/3GA PC$2.75/MF$1.45
Utah Univ Salt Lake City Dept of Civil Engineering
A NOTE RELATIVE TO THE REST CONSTRAINT IN FINITE ELASTICITY,
J. Edmund Fitzgerald. Jul 73, 24p Rept no. UTEC-CE-73-135 AFOSR-TR-73-1948
Grant AF-AFOSR-2322-72

Descriptors: (*Elasticity, Numerical analysis), Deformation, Strain(Mechanics), Cauchy problem, Green's function, Partial differential equations, Tensor analysis, Free energy.

The equations of finite elasticity whether derived from a Cauchy constitutive assumption or a Green (elastic potential) assumption reduce to equivalent forms. The usually published forms do not automatically satisfy the rest state condition wherein the stress vanishes. The rest state constraint often associated with a strain energy function is shown herein to be nonapplicable. That is, use of the rest state constraint on the form of the strain energy function precludes Neo-Hookean behavior as well as severely restricting the form of a Mooney-Rivlin material. It is shown that the rest state condition leads to a form of the constitutive equation wherein no restrictions (other than certain smoothness and differentiability assumptions) are placed upon the form of the strain energy function. A discussion of the resulting natural measures of finite strain is included. (Author)

AD-768 607/4GA PC$3.50/MF$1.45
Georgia Inst of Tech Atlanta School of Aerospace Engineering
THE APPLICATION OF RATIONAL FUNCTIONS TO PRODUCE SIMPLE APPROXIMATION OF SIGNIFICANCE IN STRUCTURAL ANALYSIS.
Final rept.,
W. H. Horton, M. K. Singhal, and E. M. Nassar. Sep 73, 59p AFOSR-TR-73-1916
Grants AF-AFOSR-1476-68, NGL-11-002-096

Descriptors: (*Structural parts, *Stresses), (*Transcendental functions, Approximation(Mathematics)), Loading(Mechanics), Vibration, Buckling(Mechanics), Beams(Structural), Numerical analysis.
Identifiers: *Rational functions, *Structural analysis, *Stress analysis, Plates(Structural members).

In the paper the unique property of rational functions - viz that the dependent variable can remain finite for an infinite variation of the independent variable and vice-versa - is exploited. Using this tool, a number of simple accurate approximations to structural problems are developed. In particular expressions for the critical loads of elastically restrained columns and the vibrational frequencies of corresponding beams are given. Useful approximations for transcendental functions are outlined and the utility of the process when deriving vibration and buckling mode shapes indicated. The value of rational functions to the experimentalist and computing specialist is emphasized. (Author)

AD-768 609/0GA PC$2.75/MF$1.45
New York Univ Bronx Dept of Aeronautics and Astronautics
VARIATIONAL METHODS FOR ANALYSIS OF STRUCTURES.
Final rept.,
A. D. Kerr. 31 Aug 73, 11p AFOSR-TR-73-1915
Grant AF-AFOSR-1990-71

Descriptors: (*Elasticity, Calculus of variations), Structural properties, Buckling(Mechanics), Partial differential equations, Continuum mechanics, Scientific research, Perturbation theory.
Identifiers: Bifurcation theory, Plates(Structural members), Structural analysis, Poisson ratio.

The report contains a summary of research conducted in the application of variational methods in elastic stability. Particular attention is given to the nonexistence of adjacent equilibrium positions at bifurcation points. Resolution of this concept was achieved and appropriately reported in the technical literature. In addition, a plate theory considering variable Young's modulus and Poisson's ratio through the thickness was presented by the author. (Author)

AD-768 659/5GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
AXISYMMETRIC BUCKLING OF RIGIDLY CLAMPED HEMISPHERICAL SHELLS,
Louis Bauer, Edward L. Reiss, and Herbert B. Keller. 21 Jun 72, 11p Rept no. NYU-ONR-H44
Contract N00014-67-A-0467-0006
Prepared in cooperation with California Inst. of Tech., Pasadena. Dept. of Applied Mathematics.
Availability: Pub. in International Jnl. of Non-Linear Mechanics, v8 p31-39 1973.

Descriptors: (*Hemispherical shells, *Buckling(Mechanics)), Loading(Mechanics), Stresses, Numerical analysis.

The shell is subjected to a uniform compressive surface load (either a pressure or a centrally directed load). The results of a numerical study are summarized and compared with experiments. (Author)

AD-768 693/4GA PC$3.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
CREEP IN ELASTIC PLATES ON AN INCOHESIVE BASE WHICH REDUCES TO A RHEOLOGICAL MODEL UNDER VARIOUS LOADING LAWS,
A. N. Suprun. 2 Aug 73, 11p Rept no. FSTC-HT-23-247-73
Trans. of Issledovaniya po Teorii Uprugosti i Plastichonosti (USSR) n56 p135-142 1970.

Descriptors: (*Structural parts, *Creep), Loading(Mechanics), Partial differential equations, Rheology, USSR.
Identifiers: Translations, Viscoelasticity, Plates(Structural members).

The author discusses a method which can be used for extending known solutions of differential equations describing the bending of a plate in an elastic medium to the case of linear viscoelastic media. (Author)

AD-768 790/8GA PC$3.00/MF$1.45
Army Materials and Mechanics Research Center Watertown Mass
A STATISTICAL THEORY FOR PREDICTING RESPONSE OF MATERIALS THAT POSSESS A DISORDERED STRUCTURE.
Technical rept.,
John J. Mccoy. Sep 73, 48p Rept no. AMMRC-TR-73-42
ARPA Order-2181

Descriptors: (*Statistical mechanics, Solids), (*Continuum mechanics, Theory), Elasticity, Probability density functions, Loading(Mechanics), Ceramic materials, Composite materials, Crystals.
Identifiers: Fiber composites.

A statistical continuum is one with material properties that can be described only in probabilistic terms. Such continua are encountered in an ever increasing number of important engineering and

scientific problems. Examples include the response of heterogeneous solids, the mechanics of the flow of blood, the dispersion of additives by a turbulent fluid, the scattering of waves by turbulence, by a temperature structure, etc. In this report a foundation is presented that can be used to describe all of these physically different phenomena. Emphasis is placed on the unique difficulties that present themselves to both the theoretical and the experimentalist and the progress that has been made in surmounting - or circumventing - these difficulties. The foundation is then applied to develop a statistical theory of heterogeneous linearly elastic solids. The applicability of the theory for predicting the response characteristics of a class of ceramics, a type of composite, a polycrystalline solid, etc., is discussed. The practical utility of the theory is demonstrated. (Author)

AD-768 875/7GA PC$3.00/MF$1.45
Polytechnic Inst of Brooklyn N Y Dept of Aerospace Engineering and Applied Mechanics
ZOCKM, A DIGITAL COMPUTER PROGRAM FOR HYDROSTATIC BUCKLING AND VIBRATIONS OF NONUNIFORM RING STIFFENED CIRCULAR CYLINDERS,
William P. Vafakos. Sep 73, 41p Rept no. PIBAL-73-19
Contract N00014-67-A-0438-0006

Descriptors: (*Structural shells, *Buckling(Mechanics)), Deformation, Hydrostatic pressure, Computer programs, Vibration.
Identifiers: ZOCKM computer program, FORTRAN 4 programming language, CDC 6600 computers, FORTRAN, *Stiffened cylinders, *Cylindrical shells.

The report contains a development and listing of digital computer program ZOCKM, which is a modification of program ZOCK written by NSRDC. The program ZOCKM computes hydrostatic buckling loads and/or free-vibration frequencies for circular cylinders reinforced by arbitrarily spaced nonuniform rings. (Author)

AD-768 889/8GA PC$11.00/MF$1.45
California Univ Berkeley Structural Engineering Lab
NONLINEAR STATIC AND DYNAMIC ANALYSIS OF SHELLS OF REVOLUTION UNDER AXISYMMETRIC LOADING.
Rept. for Jun 72-Sep 73,
S. Nagarajan. Sep 73, 179p Rept no. UCSESM-73-11
Contracts DAAA21-72-C-0727, DAAA21-72-C-0729
Report on Structures and Materials Research.

Descriptors: (*Structural shells, Loading(Mechanics)), Bodies of revolution, Kinematics, Stresses, Plasticity, Elasticity, Strain(Mechanics).
Identifiers: Static loads, Dynamic loads, Finite difference theory.

A method of analyzing nonlinear static and dynamic responses of deformable solids has been developed based on an incremental variational formulation using the Lagrangian mode of description. The material nonlinearity due to plasticity or viscoplasticity as well as the geometric nonlinearity due to large displacements are considered. The equations of motion are obtained in a linearized incremental form using the principle of virtual work and solved using step-by-step numerical integration procedures. Equilibrium check is made at the end of each step and the residual forces are added to the next increment for improved accuracy over the pure incremental method. For elastic-plastic solutions the flow theory of plasticity is used along with the von Mises yield condition for isotropically hardening materials. The viscoplastic constitutive theory is also in the form of an associated flow law and capable of considering strain rate sensitive behavior. The viscoplastic strains are taken into account using an initial strain formulation. The discretization of the structure is achieved by the use of degenerate isoparametric finite elements and the computer codes that have been developed are capable of analyzing large axisymmetric deformations of shells of revolution. (Modified author abstract)

AD-768 900/3GA PC$4.75/MF$1.45
Cambridge Acoustical Associates Inc Mass
HIGH FREQUENCY RESPONSE OF POINT-EXCITED SUBMERGED THIN SHELLS AND PLATES.
Technical rept.,
David A. Sachs. Jul 73, 55p Rept no. CAA-U-415-210
Contract N00014-69-C-0096

Descriptors: (*Structural shells, *Vibration), (*Underwater objects, Underwater sound signals), Excitation, High frequency, Equations of motion, Cylindrical bodies, Spheres.
Identifiers: Geometrical acoustics, Plates(Structural members), Frequency response, Cylindrical shells, Spherical shells.

The asymptotic high frequency response of a point-excited, submerged thin cylindrical shell is evolved. The results are compared with the corresponding asymptotic responses of thin plates and spherical shells. A ray theory for the structural responses of both submerged and in-vacuo thin structures subject to point-force excitation is proposed and is shown to agree with available known solutions. (Author)

AD-768 904/5GA PC$3.75/MF$1.45
California Univ Los Angeles Dept of Mathematics
THE AXISYMMETRIC BRANCHING BEHAVIOR OF COMPLETE SPHERICAL SHELLS,
Charles G. Lange, and Gregory A. Kriegsmann.
Oct 73, 72p
Contract N00014-69-A-0200-4051

Descriptors: (*Structural shells, *Buckling(Mechanics)), Loading(Mechanics), Stresses, Nonlinear systems, Stability, Differential equations, Transcendental functions, Integration, Spheres.
Identifiers: *Spherical shells, Befureation theory.

The purpose of the paper is to describe the axisymmetric branching behavior of complete spherical shells subjected to either external pressure or a centrally directed (dead) loading. By means of an asymptotic integration technique (based on the smallness of the ratio of the shell thickness to the shell radius) applied directly to a differential equation formulation, the authors are able to continue the solution branches from the immediate neighborhood of the branch points, where the solution has the functional form predicted by the linear buckling theory, to the region where the solution consists of either one or two dimples with the remainder of the shell remaining nearly spherical. The latter deflection states are the ones usually observed in experiments. The authors also deduce a number of results for the branching of solutions from the multiple eigenvalues. Finally, a boundary layer analysis is performed to determine the possible form of large deflection states. (Author)

AD-769 050/6GA PC$2.75/MF$1.45
Stanford Univ Calif Dept of Aeronautics and Astronautics
CREEP BUCKLING OF RELATIVELY THICK CIRCULAR CYLINDRICAL SHELLS COMPRESSED AXIALLY.
Technical rept.,
Michel Benoit, and Nicholas Hoff. Jul 73, 13p
Rept nos. SUDAAR-461, TR-25
Contract N00014-67-A-0003

Descriptors: (*Structural shells, Buckling(Mechanics)), (*Airframes, Buckling(Mechanics)), Creep, Compressive properties, Nickel, Experimental data, Tables, Cylindrical bodies.
Identifiers: Cylindrical shells.

Experimental results obtained with 31 nickel circular cylindrical shell specimens are evaluated in the light of the theory. The test results have already been reported in SUDAAR No. 415. The experimental creep buckling times obtained in axial compression at a temperature of 650F were found to be in reasonable agreement with the theoretical formulas. (Author)

AD-769 051/4GA PC$4.25/MF$1.45
Stanford Univ Calif Dept of Aeronautics and Astronautics
INTERACTION BETWEEN AXISYMMETRIC AND MULTILOBED CREEP BUCKLING OF CIRCULAR CYLINDRICAL SHELLS IN AXIAL COMPRESSION.
Technical rept.,
Michel Benoit. Aug 73, 120p Rept nos. SUDAAR-462, TR-26
Contract N00014-67-A-0112-0003

Descriptors: (*Structural shells, Buckling(Mechanics)), Cylindrical bodies, Deformation, Creep, Stresses, Strain(Mechanics), Mathematical models, Theses.
Identifiers: *Cylindrical shells.

The present theoretical investigation studies the effect of small multilobed initial deviations from the exact shape upon the deformations and the critical time of a thin-walled circular cylindrical shell which was manufactured with initial axisymmetric deformations. To facilitate the analytical work, the actual solid wall of the shell is imagined to be replaced by an equivalent sandwich wall. The general equilibrium equations derived for shallow shells are expressed in terms of the stresses and deviations corresponding to the equivalent sandwich model. The radial displacement as well as the meridional, circumferential and membrane shear stresses are expressed by finite Fourier series for each face of the sandwich model. A closed form solution is found for the multilobed deformation rates and for the critical time as well. A numerical integration of the deformation rates shows, for a given cylinder, that the multilobed creep buckling deformations grow much faster than the axisymmetric. (Modified author abstract)

AD-769 052/2GA PC$3.00/MF$1.45
Stanford Univ Calif Dept of Aeronautics and Astronautics
CREEP BUCKLING OF FLAT PLATES.
Technical rept.,
Michel Benoit, and Nicholas J. Hoff. Aug 73, 35p
Rept nos. SUDAAR-463, TR-27
Contract N00014-67-A-0112-0003

Descriptors: (*Panels(Structural), Buckling(Mechanics)), (*Airplane panels, Buckling(Mechanics)), Aluminum alloys, Creep, Experimental data, Tables.
Identifiers: Aluminum alloy 2024, *Plates(Structural members).

The present study is an experimental investigation of the creep buckling behavior of simply supported flat rectangular plates. The plates are modeled in the experiments by the four faces of square prisms which are submitted to pure axial compression in a special oven at a temperature of 600F. Thirty-three square prisms built of 0.020 in. thick 2024-T3 aluminum alloy sheet were tested at various stress levels. The continuously recorded end-shortening curves led to the determination of a creep power law for the material at 600F. The ensuing comparison of the buckling time obtained from the experiments with the theory yielded fairly good results even though the experimental scatter-band was quite large. (Author)

CEA-R-4398/GA PC$5.75/MF$1.45
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
CONTRIBUTION TO THE VIBRATORY STUDY OF THE CYLINDRICAL THIN SHELLS.
D. Boulegue, and G. Samson. Jun 73, 73p
In French. U.S. Sales Only.

Descriptors: (*Shells, *Elasticity), (*Composite materials, Elasticity), (*Steels, Elasticity), Cylindrical configuration, Mechanical vibrations, Thickness.

For abstract, see NSA 28 07, number 17731.

N73-30860/3GA PC$3.50/MF$1.45
National Research Council of Canada, Ottawa (Ontario).
ON THE CONVERGENCE OF THE GALERKIN METHOD IN NON-CONSERVATIVE STABILITY PROBLEMS CONCERNING THIN ELASTIC PLATES AND SLENDER ELASTIC RODS.
H. Leipholz. 1973, 27p NRC-TT-1673
Tran-Transl. Into English from Ingenieur-Archiev (West Ger.), V. 34, No. 5, 1965 p 290-303.

Descriptors: *Elastic cylinders, *Elastic plates, *Galerkin method, *Metal plates, *Structural analysis, Elastic properties, Mathematical models, Mechanical properties, Numerical analysis.

For abstract, see STAR 1121

N73-30861/1GA PC$3.50/MF$1.45
Bell Aerospace Co., Buffalo, N.Y.
IMPROVEMENTS TO NASTRAN.
May 73, 29p NASA-CR-132283, REPT-8667-950001
Contract NAS1-10917

Descriptors: *Computer programs, *Computerized design, Heat transfer, Stress concentration, Symmetry.

For abstract, see STAR 1121

N73-30863/7GA PC$3.75/MF$1.45
Boeing Commercial Airplane Co., Seattle, Wash.
ELASTIC BUCKLING ANALYSIS FOR COMPOSITE STIFFENED PANELS AND OTHER STRUCTURES SUBJECTED TO BIAXIAL IN-PLANE LOADS.
A. V. Viswanathan, and M. Tamekuni. Sep 73, 88p NASA-CR-2216
Contract NAS1-8858

Descriptors: *Buckling, *Composite structures, *Laminates, *Loads (Forces), *Structural analysis, Elastic properties, Mechanical properties, Numerical analysis.

For abstract, see STAR 1121

N73-30868/6GA PC$3.50/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Flugzeugbau.
BUCKLING LOADS OF SHEET METAL SILOES WITH OVERLAPPING CIRCUMFERENTIAL SEAMS BEULLASTEN VON STAHLSILOS MIT UEBERLAPPTEN RUNDNAEHTEN.
M. Esslinger. 22 Jan 73, 28p DLR-FB-73-36
In German; English Summary.

Descriptors: *Axial compression loads, *Buckling, *Circular cylinders, Iterative solution, Metal sheets, Structural analysis, Thin walled shells.

For abstract, see STAR 1121

N73-30869/4GA PC$3.00/MF$1.45
Royal Aircraft Establishment, Farnborough (England). Structures Dept.
OPTIMUM REINFORCEMENT AROUND A CIRCULAR HOLE IN A FLAT SHEET UNDER UNIAXIAL TENSION.
E. H. Mansfield, and C. J. Hanson. 1973, 13p
ARC-R/M-3723, RAE-TR-72013
Misc-Supersedes Rae-TR-72013; Arc-33736.

Descriptors: *Axial stress, *Elastic sheets, *Holes, *Reinforcement (Structures), *Tensile stress, Edges, Flat surfaces, Optimization, Stress concentration.

For abstract, see STAR 1121

N73-31801/6GA PC$15.25/MF$1.45
Technische Hogeschool, Delft (Netherlands).
FATIGUE AND STOCHASTIC LOADINGS.
J. Strating. 1973, 265p ICAF-DOC-683

Descriptors: *Fatigue tests, *Random loads, *Steel structures, Fatigue life, Normal density functions, Power spectra, Probability density functions.

For abstract, see STAR 1122

N73-31802/4GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A SINUSOIDAL-VIBRATION ANALYSIS PROGRAM FOR EXPERIMENTAL DATA.
J. A. Schoenster, and N. L. Taylor. Oct 73, 76p
NASA-TM-X-2789, L-8729

Descriptors: *Damping, *Resonant frequencies, *Sine waves, *Vibration tests, Computer programs, Data acquisition, Numerical analysis, Structural analysis.

For abstract, see STAR 1122

N73-31803/2GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
APPLICATION OF BOUNDARY INTEGRAL METHOD TO ELASTIC ANALYSIS OF V-NOTCHED BEAMS.
W. Rzaswicki, A. Mendelson, and L. U. Albers. Oct 73, 29p NASA-TN-D-7424, E-7156

Descriptors: *Beams (Supports), *Bending theory, *Stress analysis, *V grooves, Elastic properties, Mechanical properties, Numerical analysis.

For abstract, see STAR 1122

N73-31805/7GA PC$6.25/MF$1.45
Boeing Aerospace Co., Huntsville, Ala.
SSME STRUCTURAL COMPUTER PROGRAM DEVELOPMENT. VOLUME 1: BOPACE THEORETICAL MANUAL.
R. G. Vos. 31 Jul 73, 83p NASA-CR-124390, D5-17266-1-VOL-1
Contract NAS8-29821

Descriptors: *Computer programs, *Stress analysis, *Structural analysis, Creep properties, Elastic properties, Plastic properties, Stress-strain diagrams.

For abstract, see STAR 1122

N73-31806/5GA PC$10.00/MF$1.45
Boeing Aerospace Co., Huntsville, Ala.
SSME STRUCTURAL COMPUTER PROGRAM DEVELOPMENT. VOLUME 2: BOPACE USERS MANUAL.
R. G. Vos. 31 Jul 73, 160p NASA-CR-124391, D5-17266-2-VOL-2
Contract NAS8-29821

Descriptors: *Computer programs, *Creep properties, *Propulsion system configurations, *Spacecraft components, *Structural analysis, Elastic properties, Loads (Forces), Numerical analysis, Physical properties.

For abstract, see STAR 1122

N73-31807/3GA PC$5.75/MF$1.45
Boeing Aerospace Co., Huntsville, Ala.
SSME STRUCTURAL COMPUTER PROGRAM DEVELOPMENT. VOLUME 3: BOPACE DEMONSTRATION ANALYSIS OF THE SSME THRUST CHAMBER LINER.
A. H. Spring. 31 Jul 73, 74p D5-17266-3-VOL-3
Contract NAS8-29821

Descriptors: *Computer programs, *Creep properties, *High temperature environments, *Thrust chambers, Data acquisition, Elastic properties, Stress analysis, Structural analysis.

For abstract, see STAR 1122

N73-31808/1GA PC$5.50/MF$1.45
Technische Univ., Berlin (West Germany). Inst. fuer Raumfahrttechnik.
VIBRATIONS OF CYLINDRICALLY CURVED SANDWICH SHELLS, WITH FLEXIBLE SUPPORTS AND RIGID CLAMPING, AT RESONANCE AND UNDER ACOUSTIC LOADS SCHWINGUNGEN ZYLINDRISCH GEKRUEMMTER GELENKIG GELAGERTER UND FEST EINGESPANNTER SANDWICHSCHALEN BEI RESONANZ UND UNTER SCHALLBELASTUNG.
H. K. Petrick. Dec 72, 70p TUB-IR-1972/2
In German; English Summary.

Descriptors: *Cylindrical shells, *Resonant vibration, *Sandwich structures, *Structural analysis, Aircraft structures, Clamps, Rocket vehicles, Sound waves, Supports.

For abstract, see STAR 1122

SLA-73-79/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
SLADE D: A COMPUTER PROGRAM FOR THE DYNAMIC ANALYSIS OF THIN SHELLS.
S. W. Key, and Z. E. Beisinger. Jan 73, 155p

Descriptors: (*Shells, *Stress analysis), (*Computer codes, *S codes), Boundary conditions, Finite element method, Fortran, Matrices, Thickness.

For abstract, see NSA 28 07, number 17702.

20L. Solid-State Physics

AD-768 409/5GA PC$3.75/MF$1.45
Hebrew Univ Jerusalem (Israel)
ON THE FEASIBILITY OF OBSERVING PHOTOEMISSION FROM METAL CONTACTS INTO ANTHRACENE.
Final technical rept. Jul 72-Jun 73,
J. Levinson, Z. Burshtein, and A. Many. Jul 73, 35p ARDG(E)-E-1437
Contract DAJA37-72-C-4347

Descriptors: (*Photoelectric effect, Masking), (*Anthracenes, *Photoconductivity), (*Semiconductors, *Band theory of solids), Photoelectrons, Surface properties, Excitation, Carriers(Semiconductors), Israel.
Identifiers: *Energy gap, *Organic semiconductors, Electric contacts, Electron traps, Hole traps.

This work completes the study of the two processes which can mask, partly or completely, photoemission from metal contacts into anthracene: carrier photoexcitation out of surface traps which are occupied under thermal equilibrium, and photoexcitation out of bulk traps which are continuously being filled by carrier injection from the contact under study. The first process is studied by photoconductivity measurements in the

absence of contact effects. The photocurrents are shown to originate from hole photoexcitation out of surface traps. They are greatly influenced by surface treatments but even under the most optimal treatment the spectral yield is similar both in magnitude and threshold to yield curbes obtained by several workers and attributed to photoemission. For the second process, the arguments presented suggest that with contacts of alkali and alkaline-earth metals (electron injectors) and gold (Hole injector) the reported yield curves are probably associated with photo-enhanced space-charge-limited current. (Modified author abstract)

AD-768 444/2GA PC$5.00/MF$1.45
California Inst of Tech Pasadena Dept of Electrical Engineering
ANALYSIS OF SEMICONDUCTOR STRUCTURES BY NUCLEAR AND ELECTRICAL TECHNIQUES.
Final rept. Dec 70-Dec 72,
Robert W. Bower, Eri-K Chu, Jacob D. Haskell, Akio Kiraki, and Mototaka Kamoshida. 5 May 73, 54p AFCRL-TR-73-0368
Contract F19628-71-C-0056

Descriptors: (*Semiconducting films, Ion bombardment), (*Semiconductors, Doping), Silicon dioxide, Silicon, Oxides, Nitrides, Aluminum compounds, Heat treatment, Gallium arsenides, Band theory of solids, Electrical properties, Metal films, Nickel alloys, Iron alloys.
Identifiers: *Semiconductor doping, *Ion implantation, Nickel rich permalloy, Silicon nitrides, Aluminum oxides, Thin films.

The report covers three relatively distinct areas of investigations; studies of Al2O3 and Si3N4 thin films, reactions in thin solid films and doping by ion implantation. Common to all this work is the use of ion backscattering spectrometry as the principle analytical tool, supported by a number of other techniques. Among these, x-ray diffraction and scanning electron microscopy were found to be particularly well suited to supplement backscattering. (Modified author abstract)

AD-768 486/3GA Reprint
Arizona Univ Tucson Dept of Physics
SUPERCONDUCTIVITY AND MACROSCOPIC QUANTUM PHENOMENA,
T. W. Nee, D. Rogovin, and M. O. Scully. 23 May 72, 28p AFOSR-TR-73-1771
Grant AF-AFOSR-1921-70
Availability: Pub. in the Annals of Physics, v77 n1/2 p79-105 May 73.

Descriptors: (*Superconductivity, Quantum mechanics), Superconductors, Superfluidity, Wave functions, Equations of motion.
Identifiers: BCS theory.

The unique coherence properties displayed by superconductors has often lead to the observation that the entire system behaves like a single quantum particle of mass 2m and charge 2e. In this paper the authors establish the conditions under which this macroscopic quantum assertion is valid within the framework of the microscopic theory of superconductivity. (Modified author abstract)

AD-768 504/3GA Reprint
Washington Univ Seattle Dept of Physics
MAGNETO-OPTIC KERR EFFECTS IN GADOLINIUM,
J. L. Erskine, and E. A. Stern. 24 Oct 72, 18p AFOSR-TR-73-1768
Grant AF-AFOSR-1967-71
Availability: Pub. in the Jnl. of Physical Review B, v8 n3 p1239-1255 Aug 73.

Descriptors: (*Gadolinium, *Magneto-optic effect), Rare earth elements, Band theory of solids, Atomic energy levels, Electron transitions, Polarization, Ferromagnetic materials.
Identifiers: *Kerr magnetooptical effect.

An investigation of magneto-optic effects in gadolinium metal is reported. Samples prepared by vacuum evaporation were studied in situ under ultra-high-vacuum conditions to ensure clean optical surfaces. Magneto-optic Kerr rotation and ellipticity, determined using a null-type ellipsometric method, are used to calculate the magnetic contribution to the conductivity tensor. Data cover the 1-5 eV range at several temperatures. A simple model based on band calculations is used as a basis for interpretation of the data. The magneto-optic absorption is shown to have an intraband component and an interband component in analogy with ordinary optical absorption. A phenomenological intraband theory of the magneto-optic Kerr effect is presented and used to substract out the intraband contribution from experimental data. (Modified author abstract)

AD-768 524/1GA Reprint
Case Western Reserve Univ Cleveland Ohio Dept of Physics
DIRECT OBSERVATION OF CURRENT INDUCED MOTION OF THE LANDAU DOMAIN STRUCTURE,
R. P. Huebener, R. T. Kampwirth, and D. E. Farrell. 18 Jul 72, 3p AFOSR-TR-73-1767
Grant AF-AFOSR-2341-72
Prepared in cooperation with the Argonne National Lab., Ill.
Availability: Pub. in the Physics Letters, v41A n2 p105-106, 11 Sep 72.

Descriptors: (*Lead, *Superconductivity), Magnetic fields, Electric currents, Magneto-optic effect.
Identifiers: *Landau domains.

Uniform motion of the Landau domain structure under the influence of an electric transport current has been observed in Pb using a magneto-optic method. (Author)

AD-768 525/8GA Reprint
Case Western Reserve Univ Cleveland Ohio Dept of Physics
THERMALLY INDUCED FLUX MOTION IN SUPERCONDUCTING TIN,
A. K. Gupta, and D. E. Farrell. 27 Sep 72, 4p AFOSR-TR-73-1764
Grant AF-AFOSR-2341-72
Availability: Pub. in Physical Review B, v7 n7 p3037-3038, 1 Apr 73.

Descriptors: (*Tin, *Superconductivity), Magnetic fields, Superconductors, Cryogenics, Single crystals, Electric currents, Motion.
Identifiers: Landau levels.

Direct evidence is presented for thermally induced flux motion in a superconductor. The method consists of setting up the macroscopic Landau domain structure in a thin single crystal of tin and imposing a temperature gradient along the sample. Motion is monitored with the Sharvin point-contact technique, enabling one to deduce an experimental value for the actual velocity of flux motion. The dependence of this velocity on the applied temperature gradient is found to be in fair agreement with a theory due to Clem. (Author)

AD-768 532/4GA Reprint
Catholic Univ of America Washington D C Dept of Physics
THE DETECTION OF MAGNETOACOUSTIC OSCILLATIONS IN NIOBIUM,
J. R. Leibowitz, J. R. Peverley, and E. Alexander. 9 Jan 73, 5p AFOSR-TR-73-1745
Grant AF-AFOSR-1931-70
Prepared in cooperation with Maryland Univ., College Park. Revision of report dated 21 Aug 72.
Availability: Pub. in Physics Letters, v44A n4 p298-300, 18 Jun 73.

Descriptors: (*Niobium, Sound transmission), Magnetic fields, Attenuation, Oscillation, Brillouin zones.
Identifiers: Magnetoacoustics, *Magnetoacoustic attenuation, Fermi surfaces.

The authors report the detection of magnetoacoustic oscillations in niobium both for longitudinal and transverse waves. The present data suggest the dominance of oscillations associated with the distorted ellipsoids of the third Brillouin zone. (Author)

AD-768 537/3GA Reprint
Northwestern Univ Evanston Ill Dept of Physics
CONVERGENCE PROPERTIES OF APW (AUGMENTED PLANE WAVE) WAVEFUNCTIONS AND MATRIX ELEMENTS,
B. N. Harmon, D. D. Koelling, and A. J. Freeman. 1973, 8p AFOSR-TR-73-1761
Grant AF-AFOSR-2012
Sponsored in part by Atomic Energy Commission, Washington, D. C. amd National Science Foundation, Washington, D. C.
Availability: Pub. in Jnl. of Physics C: Solid State Physics, v6 p2294-2299 1973.

Descriptors: (*Gadolinium, Band theory of solids), (*Copper, Band theory of solids), (*Band theory of solids, Wave functions), Convergence, Matrix algebra.
Identifiers: Augmented plane wave method.

The convergence properties of both APW wavefunctions and various matrix elements calculated from these wavefunctions have been studied using Cu and Gd metals as examples. It is found that s-p like states converge much faster than d-like states in local properties (eg the discontinuity in slope at the muffin tin sphere radius); surprisingly however, even the d-like states converge rapidly for integrated properties (eg the charge density and optical matrix elements). It is concluded that for the materials and matrix studied, there is no need to use methods involving the matching of basis function derivitives at the APW sphere boundary; and that matrix elements can converge faster than the energy eigenvalue using the wavefunctions from the standard APW method. (Author)

AD-768 538/1GA Reprint
Northwestern Univ Evanston Ill Dept of Physics
SPIN POLARIZED ENERGY BAND STRUCTURE, SPIN DENSITIES AND THE NEUTRON MAGNETIC FORM FACTOR OF GADOLINIUM METAL,
B. N. Harmon, and A. J. Freeman. 1973, 7p AFOSR-TR-73-1759
Grant AF-AFOSR-2012-71
Prepared in cooperation with Argonne National Lab., Ill.
Availability: Pub. in Proceedings, Magnetism and Magnetic Materials, Annual Conference (18th), Denver, 1972. AIP Conference Proceedings n10 p1309-1313 1973.

Descriptors: (*Gadolinium, Band theory of solids), Atomic energy levels, Electron density, Wave functions.
Identifiers: Augmented plane wave method, Energy bands, Form factors.

Conduction electron spin densities and their contribution to the diffuse part of the neutron magnetic form factor of Gd metal, measured by Moon et al, have been determined by means of spin polarized APW calculations. Although our spin density is similar to that of Moon et al, the authors are unable to reproduce their large region of negative spin density. Thus, their theoretical form factor is considerably lower than experiment at the first (hkl) reflection. Possible reasons for this difference are discussed. (Modified author abstract)

AD-768 539/9GA Reprint
Northwestern Univ Evanston Ill Dept of Physics

THE ELECTRONIC STRUCTURE AND PROPERTIES OF TITANIUM DISULFIDE,
H. W. Myron, and A. J. Freeman. 26 Apr 73, 4p
AFOSR-TRo73-1763
Grants AF-AFOSR-2012-71, NSF-GH-34422
Availability: Pub. in Physics Letters, v44A n3 p167-168 Jun 73.

Descriptors: (*Titanium compounds, *Band theory of solids), Sulfides, Semiconductors, Superconductors.
Identifiers: *Titanium sulfides, Energy bands.

Detailed ab initio KKR energy band calculations on the layered dichalcogenide TiS2 show it to be a semiconductor, in agreement with the traditional view of Wilson and Yoffe and optical experiments and in disagreement with recent X-ray and transport observations. (Author)

AD-768 540/7GA Reprint
Northwestern Univ Evanston Ill Dept of Physics
OBSERVATION OF ITINERANT 5F STATES IN THORIUM METAL,
B. W. Veal, D. D. Koelling, and A. J. Freeman. 2 Feb 73, 6p
Grant AF-AFOSR-2012-71
Sponsored in part by Atomic Energy Commission, Washington, D.C. and National Science Foundation, Washington, D.C.
Availability: Pub. in Physical Review Letters, v30 n21 p1061-1064, 21 May 73.

Descriptors: (*Thorium, *Band theory of solids), Reflectivity, Atomic energy levels.
Identifiers: Relativistic augmented plane wave method, De Haas-Van Alphen effect.

Normal incidence reflectivity measurements between 0.5 and 6 eV on thorium metal reveal the existence of bandlike (or itinerant) f states several electron volts above the Fermi energy. The predictions of relativistic band-structure determinations are in qualitative agreement with experiment. This study provides the first direct observation and characterization of 5f electrons in metals as being itinerant in nature and unlike the 4f states in the rare earths. (Author)

AD-768 554/8GA Reprint
Florida Atlantic Univ Boca Raton Dept of Physics
THERMAL ACTIVATION ENERGY OF MANGANESE ACCEPTORS IN GALLIUM ARSENIDE AS A FUNCTION OF IMPURITY SPACING,
J. S. Blakemore, Winfield J. Brown, Jr., Merrill L. Stass, and Dustin A. Woodbury. 19 Jan 73, 6p
AFOSR-TR-73-1809
Grant AF-AFOSR-2175-72
Availability: Pub. in the Jnl. of Applied Physics, v44 n7 p3352-3354 Jul 73.

Descriptors: (*Semiconductors, Impurities), Gallium arsenides, Doping, Manganese, Heat of activation, Hall effect, Least squares method.
Identifiers: Acceptor materials, Activation energy.

The thermal ionization energy for Mn acceptors in GaAs decreases with increasing density of either Mn atoms or compensators. Measurements of the correlation of E(a) with N(a) or N(d) are complicated by impurity inhomogeneity. Envelope functions fitted to the data show the same energy (0.11 eV) for the infinite dilution asymptotic value as is found for the optical activation threshold. (Author)

AD-768 555/5GA Reprint
Belfer Graduate School of Science New York
COHERENT-POTENTIAL APPROXIMATION FOR AN N-COMPONENT ALLOY AND LOCALIZATION OF ELECTRONS,
Fumiko Yonezawa. 3 Nov 72, 9p AFOSR-TR-73-1775
Grant AF-AFOSR-2153-72
Availability: Pub. in Physical Review B, Solid State, v7 n12 p5170-5176, 15 Jun 73.

Descriptors: (*Band theory of solids, Alloys), Green's function, Approximation(Mathematics), Electrons.
Identifiers: *Coherent potential approximation, Density of states, Order disorder transformations, Elementary excitations.

It is shown that the ensemble-averaged single-particle Green's function for an electron in a disordered n-component alloy is described by a simple expression in the coherent-potential approximation. Within the appropriate limits, it exhibits dilute alloy, virtual crystal, weak-coupling limit, and atomic behaviors. For a special model band structure of parabolic form, the problem of evaluating the quasiparticle density of states is reduced to that of solving a polynomial of n + 1 order, which has either n + 1 real solutions or n - 1 real solutions in addition to two complex-conjugate solutions for a given set of parameters. The types of the density of states--persistence or amalgamation--are judged by the types of solutions. The formulation is also useful to prove the sum rules for the numbers of states. In the limit of n infinite, continuous distributions of atomic levels are studied and the criterion for the Anderson transition is estimated. (Author)

AD-768 558/9GA Reprint
California Univ Irvine Dept of Physics
MAGNON EDGE MODES.
Technical rept.,
T. M. Sharon, and A. A. Maradudin. 2 Mar 73, 8p
Rept no. TR-73-10 AFOSR-TR-73-1934
Grant AF-AFOSR-2018-71
Availability: Pub. in Solid State Communications, v13 p187-191 1973.

Descriptors: (*Ferromagnetic materials, Mathematical models), Ferromagnetism, Equations of motion, Dispersion relations.
Identifiers: *Magnons, *Heisenberg ferromagnets, Simple cubic lattices.

The authors present a theory of long wavelength magnons localized at the apex of a semi-infinite, right angle wedge of a simple cubic, Heisenberg ferromagnet, with nearest and next nearest neighbor exchange interactions, formed by the intersection of two (100) surfaces. The finite difference equation of motion for the magnon creation operators is converted into a partial differential equation in the long wavelength limit, which incorporates the boundary conditions on these operators at the faces of the wedge. The modes obtained are wavelike in the direction parallel to the edge of the wedge, and their amplitudes decay exponentially with increasing distance into the wedge from its apex. The energies of these modes lie below those of bulk and surface magnons. (Author)

AD-768 559/7GA Reprint
California Univ San Diego La Jolla Dept of Physics
MAGNETIC ORDERING IN (LA, GD)AL2 ALLOYS,
M. B. Maple. 8 Jan 73, 7p AFOSR-TR-73-1774
Grant AF-AFOSR-2073-71
Availability: Pub. in Solid State Communications, v12 p653-656 1973.

Descriptors: (*Intermetallic compounds, Magnetic properties), Aluminum alloys, Gadolinium alloys, Lanthanum compounds, Cryogenics.
Identifiers: *Magnetic ordering, Aluminum intermetallics, Lanthanum intermetallics, Gadolinium intermetallics.

The detailed dependence of the magnetic ordering temperature theta on Gd concentration n below approximately 15 at .% Gd substitution for La is reported for the system (LaGd)Al2. In this concentration range, the theta versus n curve lies markedly below the extrapolation of the linear behavior previously observed for concentrations of less than 20 at .% Gd, and apparently goes to zero at a finite concentration. The effective moment of Gd is enhanced by 1 mu(B) over the free ion value. (Author)

AD-768 562/1GA Reprint
Colorado State Univ Fort Collins Dept of Physics
NUCLEAR-ACOUSTIC-RESONANCE ABSORPTION AND DISPERSION IN ALUMINUM,
R. G. Leisure, D. K. Hsu, and B. A. Seiber. 16 Apr 73, 5p AFOSR-TR-73-1811
Grant AF-AFOSR-2042-71
Availability: Pub. in Physical Review Letters, v30 n26 p1326-1329, 25 Jun 73.

Descriptors: (*Aluminum, Nuclear resonance), Ultrasonic radiation, Phonons, Absorption, Dispersion relations.
Identifiers: *Nuclear acoustic resonance, Phonon spin interactions.

Nuclear-acoustic-resonance dispersion has been observed for the time in a metal. Absorption and dispersion signals in aluminum were investigated as a function of frequency, sound-wave velocity, and temperature. The line shapes of both absorption and dispersion signals show temperature-dependent asymmetries which are in striking agreement with theory. (Author)

AD-768 563/9GA Reprint
City Coll New York Dept of Physics
POLARON BOUND IN A COULOMB POTENTIAL. II,
Meheryar Engineer, and N. Tzoar. 29 Dec 72, 7p
AFOSR-TR-73-1845
Grant AF-AFOSR-1978-71
See also report dated 12 Oct 71, AD-747 181.
Availability: Pub. in Physical Review B, v8 n2 p702-706, 15 Jul 73.

Descriptors: (*Semiconductors, Band theory of solids), Electrons, Phonons, Interactions, Ground state, Perturbation theory.
Identifiers: *Polarons, Electron phonon interactions.

The authors calculate, to second order in the electron-photon interaction, the change in energy induced by phonon fluctuations for an electron bound tp a Coulomb impurity in a polar crystal. Calculations are formally valid for arbitrary strength of the Coulomb potential. However, second-order perturbation theory itself fails when either the electron-phonon or the electron-impurity couplings are very large. The energy shifts of the 2s and 2p states are presented as a function of the strength of the Coulcomb interaction. It is found that (i) the energy change is larger for the 2s than for 2p state; (ii) contrary to the earlier findings for the ground state, polaron effective-mass theory is not in good agreement with the calculated results for the n=2 states. (Modified author abstract).

AD-768 571/2GA Reprint
Case Western Reserve Univ Cleveland Ohio Dept of Physics
HIGHLY REGULAR DOMAIN MOTION IN THE DYNAMIC INTERMEDIATE STATE OF SUPERCONDUCTING TIN,
D. E. Farrell, and L. Isett. 29 Sep 71, 11p AFOSR-TR-73-1766
Contract F44620-69-C-0077
Availability: Pub. in Physical Review B, v5 n9 p3523-3530, 1 May 72.

Descriptors: (*Tin, *Superconductivity), Superconductors, Cryogenics, Magnetic Fields, Electric currents.
Identifiers: Landau levels.

Using the Sharvin point-contact technique, the regularity of domain motion in the dynamic intermediate state of superconducting tin has been investigated as a function of temperature, applied magnetic field, and transport current. It is found that, when the magnetic field is increased so as to

lie in a range closer to the the critical field than has been previously investigated systematically, an extremely drastic increase in the regularity of the motion occurs, independent of temperature and sample condition. It is suggested that this drastic increase represents the onset of motion of a modified Landau domain structure, freed from the perturbing influence of the ends of the sample. A new phenomenon of 'domain healing' is reported in the highly regular regime. (Author)

AD-768 572/0GA Reprint
Case Western Reserve Univ Cleveland Ohio Dept of Physics
EXPERIMENTAL REALIZATION OF HIGHLY REGULAR MOTION OF THE LANDAU DOMAIN STRUCTURE,
David E. Farrell. 22 Nov 71, 6p AFOSR-TR-73-1765
Contract F44620-69-C-0077
Availability: Pub. in Physical Review Letters, v28 n3 p154-156, 17 Jan 72.

Descriptors: (*Tin, *Superconductivity), Cryogenics, Superconductors, Magnetic fields, Electric currents.
Identifiers: Landau levels.

A new experimental configuration has been discovered in which motion of the superconducting domain structure can be realized under ideal conditions. The measured spatial periodicity of the moving structure in tin corresponds closely to the predictions of the Landau model. (Author)

AD-768 577/9GA Reprint
Belfer Graduate School of Science New York
THEORY OF THE TWO-IMPURITY KONDO EFFECT IN THE PRESENCE OF AN IMPURITY-IMPURITY EXCHANGE INTERACTION,
Yeun C. Tsay, and Michael W. Klein. 13 Jul 71, 16p AFOSR-TR-73-1841
Contract F44620-71-C-0013
Availability: Pub. in the Jnl. of Physical Review B, v7 n1 p352-364, 1 Jan 73.

Descriptors: (*Band theory of solids, Impurities), Green's function, Interactions.
Identifiers: Magnetic impurities, Impurity bands, *Kondo effect, Exchange interactions.

The authors examine the two-impurity Knodo effect by driving the equation of motion of a set of Green's functions using the two-impurity s-d Hamiltonian with an added exchange term of the form W(vectored dot product of S(0) times S(1)), where vector S(0) and vector S(1) are the spin operators of the two impurities. (Modified author abstract)

AD-768 591/0GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
THE DYNAMIC FIELD OF A GROWING PLANE ELLIPTICAL SHEAR CRACK,
Paul G. Richards. 15 Aug 73, 23p Rept nos. Scientific-10, Contrib-1957 AFCRL-TR-73-0526
Contract F19628-71-C-0245, ARPA Order-1795
Availability: Pub. in the International Jnl. of Solids and Structures, v9 p843-861 1973.

Descriptors: (*Crack propagation, Mathematical models), (*Earthquakes, Crack propagation), Equations of motion, Boundary value problems, Fracture(Mechanics), Stresses.

The radiation for a three-dimensional problem of brittle fracture is investigated. A crack is presumed to nucleate at a point in an infinite prestressed elastic medium, and the crack subsequently grows steadily with subsonic rupture velocities, maintaining the shape of an ellipse. Shear stresses are relieved by the crack, and exact solutions are derived for the acceleration and stress-rate (at every point of the medium) in terms of single integrals and algebraic expressions. The solutions are evaluated analytically at wavefronts and singularities, and numerically, at different points in the medium, for different growth rates of the crack. (Author)

AD-768 601/7GA Reprint
California Univ San Diego La Jolla Dept of Physics
THE ELECTRICAL RESISTIVITY OF BARIUM AND YTTRIUM AT HIGH PRESSURE,
A. R. Moodenbaugh, and Z. Fisk. 12 Mar 73, 4p AFOSR-TR-1807
Contract F44620-72-C-0017
Availability: Pub. in the Physics Letters, v43A n6 p479-480, 23 Apr 73.

Descriptors: (*Yttrium, Resistance(Electrical)), (*Barium, Resistance(Electrical)), High-pressure research, Superconductivity.
Identifiers: Electrical resistivity.

Electrical resistivity data suggest that yttrium and barium become d-metals under pressure. This behavior correlates with the pressure-induced superconductivity. (Author)

AD-768 625/6GA PC$4.50/MF$1.45
Pennsylvania State Univ University Park Materials Research Lab
FERROELECTRIC RESEARCH AND DEVICE EXPLORATION.
Final rept. 15 Mar 72-30 Jun 73,
Leslie E. Cross, and Robert E. Newnham. Aug 73, 134p AFAL-TR-73-280
Contract F33615-72-C-1632

Descriptors: (*Ferroelectric crystals, Physical properties), Crystal growth, Crystal structure, Single crystals, Dielectric properties, Hydrostatic pressure, Hysteresis, Optical properties, Recrystallization, Differential thermal analysis, X-ray diffraction analysis, Bismuth compounds, Tantalum compounds, Strontium compounds.
Identifiers: *Lead germanates, Lead vanadates, *Barium oxides, Platinates, Stannates.

Work on this contract has demonstrated through the correlation of structural, dielectric and optical studies on mixed bismuth oxide layer structure compounds what is perhaps the first well authenticated instance of a ferroelectric:ferroelectric phase transition in the single crystal $Bi_2SrTa_2O_9$ which involves no change of crystal symmetry. A new family of organo-metallic ferroelastic crystals embracing the compounds Isopropyl Ammonium Chloroplatinate (IPACP) and Chlorostannate (IPACS) has been investigated and shown to have potentially interesting thermo-optic and acoustooptic properties. Dielectric and structural studies have been continued on $Pb_5Ge_3O_{11}$ crystals and solid solutions, and the strong dielectric relaxation for (Xi(33) near T(c) has been partially resolved. For the system $Pb_5Ge_{(2-x)}Si_{(x)}O_{11}$ glassy phases phases have been quenched from the stoichiometric ferroelectric compositions, and the recrystallization to a ferroelectric polycrystalline form investigated. (Modified author abstract)

AD-768 661/1GA Reprint
State Univ of New York Albany Dept of Physics
EPR STUDIES IN NEUTRON-IRRADIATED SILICON: A NEGATIVE CHARGE STATE OF A NONPLANAR FIVE-VACANCY CLUSTER (V SUB 5(-)),
Young-Hoon Lee, and James W. Corbett. 7 May 73, 17p
Contract N00014-70-C-0296
Availability: Pub. in Physical Review B, v8 n6 p2810-2826, 15 Sep 73.

Descriptors: (*Silicon, Paramagnetic resonance), (*Semiconductors, Neutron reactions), Radiation damage, Defects(Materials), Band theory of solids, Wave functions, Tensor analysis, Hyperfine structure.
Identifiers: *Electron paramagnetic resonance.

EPR studies are carried out for the float-zone intrinsic silicon irradiated with reactor neutrons up to the total fluence 10 to the 18th power n/sq cm. Details of the Si29 hyperfine structure and of the g tensor in the P-1 spectrum are observed with respect to temperature from 77 to 350K. The anisotropy of the g tensor and its continuous variation with temperatures are also discussed in terms of simple linear-combination-of-atomic-orbitals molecular orbitals and of the experimental results on the resonant wave function. The line width broadening of the hyperfine lines is discussed on the basis that it is mainly due to transitions between the ground and excited electron states. Based on the present results, a defect model for this center is established: a negative charge state of a nonplanar five-vacancy cluster. (Modified author abstract)

AD-768 662/9GA Reprint
Westinghouse Electric Corp Pittsburgh Pa Research and Development Center
INTERACTION OF ELASTIC WAVES WITH CYLINDRICAL DOMAINS,
W. J. Carr, Jr. 1973, 7p AFOSR-TR-73-1945
Contract F44620-72-C-0035
Availability: Pub. in Proceedings of Annual Conference, Magnetism and Magnetic Materials (18th), Denver, 1972 - AIR Conference Proceedings n10 p369-372 1973.

Descriptors: (*Magnetic materials, Magnetic properties), Sound transmission, Wave functions, Equations of motion.
Identifiers: *Magnetic domains, Magnetic bubble domains, Elastic waves.

The interaction of a cylindrical magnetic domain with an elastic wave is calculated, based on the strain sensitivity of the wall energy. For a sound wave with angular frequency omega and velocity c, the domain moves with the velocity of the sound wave if the interaction is sufficiently large. For smaller interactions which are typical of present materials, the domain drifts in the direction of the sound wave and also oscillates, with the frequency of oscillation and average velocity less than omega and c. For a static wave the domain moves to a point of maximum or minimum strain. (Author)

AD-768 663/7GA Reprint
Westinghouse Electric Corp Pittsburgh Pa Research and Development Center
TWO TYPES OF BUBBLES IN GARNET FILMS,
A. I. Braginski, T. R. Oeffinger, R. W. Patterson, and S. H. Charap. 1973, 8p AFOSR-TR-73-1943
Contract F44620-72-C-0035
Availability: Pub. in AIP Conference Proceeding, Magnetism and Magnetic Materials, Annual Conference (18th), Denver, n10 p354-358 1973.

Descriptors: (*Garnet, Magnetic properties), Erbium compounds, Iron compounds, Gallium, Anisotropy, Stresses, Strain(Mechanics), Magneto-optic effect, Thin film storage devices.
Identifiers: *Magnetic bubble domains, Thin films, Faraday effect.

Magnetic domains were studied in epitaxial gallium-substituted erbium iron garnet films prepared by chemical vapor deposition on dysprosium-substituted dadolinium gallium garnet substrates. The stress-induced uniaxial anisotropy was produced by a film-substrate lattice parameter mismatch. Two types of bubble domains were observed in relatively thick samples which were severly stressed.

AD-768 667/8GA Reprint
California Univ San Diego La Jolla Dept of Physics
CORRELATION EFFECTS IN THE SURFACE ENERGY OF METALS.
Technical rept.,
Walter Kohn. 20 Apr 73, 5p Rept no. TR-22
Contract N00014-69-A-0200-6026
Availability: Pub. in Solid State Communications, v13 n3 p323-324 1973.

Descriptors: (*Metals, Surface properties), Plasma oscillations.
Identifiers: *Surface energy, *Plasmons.

It is argued that the correlation energy plays a minor role in the surface energy of metals, compared to kinetic, electrostatic and exchange energies. Recent work in which the surface energy is attributed primarily to changes in plasmon zero point energy during the creation of the surface is criticized. (Author)

AD-768 706/4GA PC$6.00/MF$1.45
Watervliet Arsenal N Y
STRAIN ENERGY RELEASE RATE FOR A CRACK UNDER COMBINED MODE I AND MODE II.
Technical rept.,
M. A. Hussain, S. L. Pu, and J. H. Underwood.
Aug 73, 78p Rept no. R-WV-T-6-29-73

Descriptors: (*Crack propagation, *Fracture(Mechanics)), Stresses, Strain(Mechanics), Energy, Equations of motion, Integral equations.
Identifiers: Strain energy method.

The energy release rate for a crack subjected simultaneously to mode one and mode two conditions was computed by path-independent integrals, using the elastic solution of a deflected crack, having a main branch and a propagation branch. The elasticity solution was obtained from the functional integral equations by the process of iterations. This process leads to a point-wise exact solution in the limit as the propagation branch goes to zero. Interestingly enough, the results indicate that the solution in the limit as the propagation branch goes to zero is not the same as the solution with no branch. Using the Griffith-Irwin criterion, incipient paths of propagation of such a crack were obtained from the maximum value of the energy release rate. To check the validity of the results, an experiment, which gives a pure mode two condition at the tip of the crack, was devised. The results were in excellent agreement with the theory. The energy release rate, in parametric form, can be used for any crack subjected to mode one and mode two loading conditions. (Modified author abstract)

AD-768 795/7GA PC$3.00/MF$1.45
Utah Univ Salt Lake City Dept of Physics
ELECTRONIC AND RADIATION DAMAGE PROPERTIES OF RUTILE.
Progress rept. 1 Aug 72-15 Aug 73,
John W. DeFord, Owen W. Johnson, and Franz Rosenberger. 15 Aug 73, 26p
Grant DAHC15-73-G-2, ARPA Order-1610

Descriptors: (*Rutile, Band theory of solids), Electrical properties, Titanium compounds, Dioxides, Chemisorption, Hydrogen, Diffusion, Radiation damage, Electron spin resonance, Crystal growth, Mass spectroscopy.
Identifiers: *Titanium dioxide.

The basic theory and equations describing diffusion of charged ions in a semiconductor (or insulator) such as TiO2, in the presence of electric fields induced by variation of the concentration of these ions, was outlined in the last progress report. The resulting coupled differential equations (which are non-linear) cannot be solved analytically, except for certain limiting cases which are not particularly helpful, and hence must be treated numerically. A major portion of the effort during this period has been devoted to developing a computer program to handle this problem. Other areas of research include electron spin resonance measurements, and associated with lattice defects or impurities always present in the lattice, and crystal growth and characterization.

AD-768 802/1GA PC$3.00/MF$1.45
California Univ Berkeley
SUPERCONDUCTING WEAK LINKS FOR MIXING AT MILLIMETER-WAVE FREQUENCIES.
Final rept. 15 Jun 70-14 Jun 73,
T. Van Duzer. 1973, 9p AROD-8324:13-E
Grant DA-ARO-D-31-124-70-G60

Descriptors: (*Superconductors, Design), Vanadium, Indium, Superconductivity, Detectors, Millimeter waves, X band, V band.
Identifiers: *Josephson junctions, Thin films, *Superconducting weak links.

The goals of the work were to fabricate superconductive thin-film constrictions with an electron microscope and to test them as mixers. During the grant period indium and vanadium constrictions were made with submicron dimensions and these were tested in detection and mixing modes. Most of the tests were conducted at X-band frequencies and some were done at V-band. A computer program was developed to study the theoretical behavior of a circuit model of Josephson devices such as thin-film constrictions. Considerable information was derived from the calculations and good agreement with experiments was obtained in some cases. In the process of developing sufficient understanding of electron-resist exposures, the author worked out a theory which gives general guidance for the use of electron resists for microdevice fabrication. Simple arrays of two and three devices were studied under dc conditions. A theoretical description of a generally asymmetric array was developed, taking account of the self- and mutual inductances.

AD-768 805/4GA PC$2.75/MF$1.45
Stanford Univ Calif Center for Materials Research
RESEARCH ON AMORPHOUS MATERIALS.
Final technical rept. 1 Jun 72-31 May 73,
W. E. Spicer, A. Bienenstock, and R. H. Bube. 31 May 73, 11p Rept no. CMR-73-10
Grant DA-ARO-D-31-124-72-G151, ARPA Order-1562

Descriptors: (*Semiconductors, Band theory of solids), Electrical properties, Crystal structure, Photoconductivity, Selection rules.
Identifiers: *Amorphous materials, *Amorphous semiconductors, Density of states.

The problems addressed under this contract can most easily be broken down into three groups. The first involves the determination of electronic structure of amorphous materials, e.g., density of states and optical selection rules. Here considerable emphasis was placed on the changes in electronic structure observed in going from the crystalline to amorphous forms of the materials and in comparison of the experimental results with theoretical predictions. The second part of the work emphasized the structural aspect of amorphous materials and the development and refinement of experimental and theoretical tools by which the structure can be determined. The third feature of this project was a study aimed at the problem of photoconductivity in the rather complex chalcogenide alloys. Experimentally, the approach was to study the measurement of dark current, photoconductivity, thermoelectric power and field effect. A theoretical model was developed for photoconductivity in these materials which is consistant with the experimental data.

AD-768 989/6GA PC$4.25/MF$1.45
Missouri Univ Rolla Graduate Center for Materials Research
MAGNETIC STRUCTURE DETERMINATION OF RARE EARTH-COBALT-IRON SYSTEMS, RFE(X)CO(5-X) BY NEUTRON DIFFRACTION.
Annual technical rept. no. 2, 15 Mar 72-31 Jul 73,
William J. James, and Remy Lemaire. Aug 73, 43p
AFML-TR-73-219
Contract F33615-71-C-1332
See also AD-748 429.

Descriptors: (*Intermetallic compounds, Diffraction analysis), (*Cobalt alloys, Magnetic properties), Iron alloys, Rare earths, Neutron diffraction analysis, X-ray diffraction analysis, Thorium alloys, Yttrium compounds, Lanthanum compounds, Crystal structure.
Identifiers: *Cobalt intermetallics, *Iron intermetallics, Permanent magnets.

Magnetic, x-ray and neutron diffraction studies were made to determine the magnetic and structural effects produced by substitution of Fe for Co in intermetallic compounds of the CaCu5-type structure with space group P6mmm. Compounds of Th(Co(1-x)Fe(x))5 and Y(x)La(1-x)(Co(y)Fe(1-y))4.5-5.0 were prepared by various induction methods and then annealed. The samples were characterized by x-ray powder analysis and metallographically. The easy axis of magnetization was determined by x-ray diffraction of powdered specimens oriented in a magnetic field. In all cases the axis is found to be vector c. (Modified author abstract)

AD-769 019/1GA Reprint
Naval Weapons Center China Lake Calif
INELASTIC LOW-ENERGY-ELECTRON DIFFRACTION FOR SURFACE-PLASMON STUDIES: EXTENDED MEASUREMENTS ON EPITAXIAL AL(111).
Technical publication,
J. O. Porteus, and W. N. Faith. 7 Dec 72, 20p Rept no. NWC-TP-5582
ARPA Order-2175
Availability: Pub. in Physical Review B, Solid State, v8 n2 p491-505, 15 Jul 73.

Descriptors: (*Electron diffraction analysis, Surfaces), (*Aluminum, Electron diffraction analysis), Inelastic scattering.
Identifiers: Low energy electron diffraction, Plasmons.

Inelastic low-energy-electron diffraction measurements on a clean Al(111) surface have been greatly extended and improved. This provides the experimental basis for a much more accurate determination of the high-momentum surface-plasmon dispersion and lifetime. The surface is prepared in situ in an ultrahigh-vacuum scanning diffractometer by epitaxial deposition on a Si(111) single-crystal wafer. Specular beam inelastic intensity profiles are measured in the <1,1, = 2> and <1, = 1, 0> directions at 15 and 25 degrees incidence. The primary beam energy is chosen to correspond closely to both diffraction-before-loss and loss-before-diffraction processes involving different vestigial Bragg peaks at roughly 50 and 100 eV. Present emphasis is on loss profiles, which have recently been shown to be essentially free of complicating dynamical effects. (Modified author abstract)

AD-769 030/8GA Not available NTIS
Sussex Univ Brighton (England) School of Mathematical and Physical Sciences
MAGNETORESISTANCE OF A DILUTE FERROMAGNETIC PDMN ALLOY: ACOUSTIC- AND OPTIC-MODE EXCITATIONS,
Gwyn Williams, G. A. Swallow, and J. W. Loram.
29 Jun 72, 13p DRB-Reprint-3696
Contract F61052-68-C-0011
Prepared in cooperation with Manitoba Univ., Winnipeg. Dept. of Physics.
Availability: Pub. in Physical Review B, v7 n1 p257-266, 1 Jan 73.

Descriptors: (*Palladium alloys, Magnetic properties), Cryogenics, Manganese alloys, Resistance(Electrical), Impurities, Polarization, Band theory of solids, Antiferromagnetism, Great Britain.
Identifiers: *Magnetoresistivity.

Magnetoresistance measurements on a Pd-2.91-at.% Mn alloy in the temperature range 1.4-20K and in applied fields up to 60 kOe are presented. The data demonstrate the effects of interimpurity (near-neighbor) covalent admixture, the antifer-

romagnetic coupling from which appears to be in qualitative agreement with the calculations of Moriya. These data also allow an estimate of the near-neighbor Mn-Mn interaction energy to be made, and this is compared with quantitative estimates on the basis of the double-resonance coupling mechanism of Caroli and Blandin. By including a magnetic field in the collective-excitation model of Long and Turner, the magnetoresistance data can be fitted once allowance has been made for near-neighbor antiferromagnetic coupling. The acoustic-spin-wave stiffness D, which is obtained by fitting the data to this model, is found to be field dependent; it decreases rapidly with increasing field. The possibility of optical-mode collective excitations is briefly discussed. (Author)

AD-769 090/2GA PC$8.00/MF$1.45
Army Foreign Science and Technology Center Charlottesville Va
THE PHYSICS OF METAL FILMS (FIZIKA METALLICHESKIKH PLENOK).
29 Oct 73, 119p Rept no. FSTC-HT-23-2135-72
Trans. of Metallofizika (USSR) n26 115p 1969.

Descriptors: (*Metal films, Physical properties), (*Foils, Physical properties), Ferromagnetic materials, Magnetic properties, Anisotropy, Crystal structure, Deformation, Stresses, Silver, Proton bombardment, Resistance(Electrical), Epitaxial growth, Aluminum, Vanadium, Niobium, Tantalum, Rare earths, Manufacturing methods, USSR.
Identifiers: Translations, Nickel rich permalloy, Plastic deformation, Thin films, Magnetic anisotropy, Magnetic susceptibility, *Magnetic films.

The collection presents new data on the influence of disruptions in crystalline structure and internal stresses on the magnetic properties of ferromagnetic films, and also studies problems of the technology of production of metal films and foils.

AECL-4454/GA PC$3.25/MF$1.45
Atomic Energy of Canada LTD., Chalk River (Ontario). Chalk River Nuclear Labs.
COLOUR CENTRES AND POINT DEFECTS IN IRRADIATED CALCIUM FLUORIDE.
B. G. Childs, P. J. Harvey, and H. Ritchie. Mar 73, 21p
U.S. Sales Only.

Descriptors: (*Calcium fluorides, *Physical radiation effects), Absorption spectra, Annealing, Color centers, Doped materials, Low temperature, Medium temperature, Point defects, Sodium fluorides, Spectra, Yttrium fluorides.

For abstract, see NSA 28 08, number 18746.

BNWL-SA-4727/GA PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash.
MICROSTRUCTURE OF ION BOMBARDED SINGLE CRYSTAL MOLYBDENUM.
J. L. Brimhall, and E. P. Simonen. 1973, 11p
CONF-730813-5

Descriptors: (*Molybdenum, *Ion implantation), Mev range 01-10, Microstructure, Monocrystals, Physical radiation effects, Polycrystals, Radiation doses, Swelling, Tantalum ions, Very high temperature, Voids.

For abstract, see NSA 28 08, number 18869.

CALT-767-P-3-34/GA PC$3.00/MF$1.45
California Inst. Of Tech., Pasadena. W. M. Keck Lab. Of Engineering Materials.
INTRODUCTION OF DISLOCATIONS AND SLIP BANDS IN MOLYBDENUM SINGLE CRYSTALS.
S. S. Lau, and T. Jr. Vreeland. 1972, 12p
Contract AT(04-3)-767

Descriptors: (*Molybdenum, *Screw dislocations), Burgers vector, Monocrystals, Orientation, Slip.

For abstract, see NSA 28 08, number 18747.

CALT-822-52/GA PC$5.75/MF$1.45
California Inst. Of Tech., Pasadena. W. M. Keck Lab. Of Engineering Materials.
ANOMALOUS ELECTRICAL RESISTIVITIES AND MAGNETIC PROPERTIES OF AMORPHOUS METALLIC ALLOYS.
R. Hasegawa. Jun 73, 74p
Contract AT(04-3)-822

Descriptors: (*Nickel alloys, *Physical properties), (*Palladium alloys, Physical properties), (*Iron alloys, Physical properties), (*Phosphorus compounds, Physical properties), Amorphous state, Electric conductivity, Kondo effect, Low temperature, Magnetism, Magnetoresistance, Medium temperature, Ultralow temperature.

For abstract, see NSA 28 07, number 17723.

CEA-CONF-2254/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
OVERHAUSER EFFECT AND EXCITON MOTION IN A SALT OF TCNQ.
B. Marticorena, and M. Nechtschein. 1972, 7p
CONF-720810-2
U.S. Sales Only.

Descriptors: (*Cyanides, *Excitons), (*Quinones, Excitons), (*Aromatics, Excitons), (*Arsenic compounds, Excitons), Organometallic compounds, Overhauser effect.

For abstract, see NSA 28 07, number 17724.

CEA-CONF-2255/GA PC$3.00/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
LOW FREQUENCY BEHAVIOR OF THE SPIN CORRELATION SPECTRUM IN A REAL ONE-DIMENSIONAL SYSTEM.
J. P. Boucher, F. Ferrieu, and M. Nechtschein. 1972, 7p CONF-720810-3
U.S. Sales Only.

Descriptors: (*Piperidines, *Spin), (*Hydroxy compounds, Spin), Correlations, Exchange interactions, Frequency dependence, Magnetic resonance, Radicals.

For abstract, see NSA 28 07, number 17725.

CEA-R-4371/GA PC$9.25/MF$1.45
Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
DYNAMIC POLARIZATION IN PARAMAGNETIC SOLIDS AND MICROSCOPIC CORRELATION FUNCTIONS.
J. P. Boucher. Jun 73, 143p
In French. U.S. Sales Only.

Descriptors: (*Nuclear alignment, *Paramagnetism), (*Solids, Paramagnetism), Correlation functions, Exchange interactions, Overhauser effect, Polarization, Relaxation, Spin, Thermodynamics, Time measurement.

For abstract, see NSA 28 07, number 17729.

COM-73-11705/3GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
AMORPHOUS SEMICONDUCTORS. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1971-Sep 73,
Elizabeth A. Harrison. Oct 73, 148p* NTIS-WIN-73-055
Supersedes NTIS-PK-16.

Descriptors: (*Semiconductors(Materials), *Bibliographies), Semiconducting films, Thin films, Electric switches.
Identifiers: *Amorphous semiconductors, Ovonic switches.

The NTISearch bibliography contains 143 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. Includes abstracts of research on amorphous semiconducting thin films, material properties, ovonics, applications and theory.

CONF-720349-(Abstr.)/GA
PC$5.25/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
THIRTY-SECOND ANNUAL CONFERENCE ON PHYSICAL ELECTRONICS, ALBUQUERQUE, NEW MEXICO, MARCH 20--22, 1972.
1972, 62p

Descriptors: (*Electronic structure, *Meetings), (*Surfaces, Meetings), (*Adsorption, Meetings), (*Electron emission, Meetings), Auger effect, Desorption, Field emission, Gases, Ionization, Photoelectric emission, Proceedings, Semiconductor devices, Semiconductor materials, Spectroscopy.

For abstract, see NSA 28 08, number 18592.

CONF-730715-1/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
CATION SELF DIFFUSION IN RUTILE.
T. S. Lundy, and W. A. Coghlan. 1972, 16p

Descriptors: (*Rutile, *Self-diffusion), Anisotropy, Boron, Cations, Crystal lattices, Interstitials, Lithium.

For abstract, see NSA 28 08, number 20609.

CONF-730715-2/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
TRAPPING OF MOBILE INTERSTITIALS DURING IRRADIATION OF ALKALI HALIDES.
E. Sonder. 1972, 15p

Descriptors: (*Halides, *Physical radiation effects), (*Alkali metal compounds, Physical radiation effects), F centers, Frenkel defects, Interstitials, Ionizing radiations, Low temperature, Medium temperature, Motion, Trapping.

For abstract, see NSA 28 08, number 18870.

CONF-730813-1/GA PC$4.00/MF$1.45
Argonne National Lab., Ill.
HELIUM-ION IRRADIATION OF VANADIUM AND NIOBIUM.
S. K. Das, and M. Kaminsky. 1972, 15p

Descriptors: (*Vanadium, *Physical radiation effects), (*Niobium, Physical radiation effects), Bubbles, Deformation, Helium ions, High temperature, Ion beams, Ion channeling, Kev range 100-1000, Medium temperature, Radiation doses, Slip, Surfaces, Temperature dependence, Very high temperature, Voids.

For abstract, see NSA 28 08, number 18871.

CONF-730813-3/GA PC$3.00/MF$1.45
Oak Ridge National Lab., Tenn.
IMAGE CONTRAST OF DISLOCATION LOOPS IN BCC METALS.
S. M. Ohr. 1972, 7p

Descriptors: (*Niobium, Dislocations), (*Electron microscopy, *Images), (*Dislocations, Electron microscopy), (*Bcc lattices, Dislocations), Burgers vector, Electron diffraction, Metals, Physical radiation effects.

For abstract, see NSA 28 08, number 18872.

CONF-730920-1/GA PC$3.00/MF$1.45
Tennessee Univ., Knoxville. Dept. Of Chemical and Metallurgical Engineering.
ASSESSMENT OF THE ACCURACY OF THE HIGH TEMPERATURE HEAT CAPACITY OF SOLID METALS.
C. R. Brooks, and E. E. Stansbury. 1973, 10p
Contract AT(40-1)-3291

Descriptors: (*Aluminium, *Specific heat), (*Aluminium oxides, Specific heat), (*Iron, Specific heat), (*Gold, Specific heat), Comparative evaluations, High temperature, Meetings, Metals, Platinum, Solids, Specifications, Standards, Tantalum, Very high temperature.

For abstract, see NSA 28 08, number 18749.

COO-3151-17/GA PC$5.25/MF$1.45
Cornell Univ., Ithaca, N. Y. Lab. Of Atomic and Solid State Physics.
HYDROSTATIC PRESSURE STUDIES OF MAGNETIC MODES IN THE FAR INFRARED.
K. C. Johnson, and A. J. Sievers. Apr 73, 63p
Contract AT(11-1)-3151

Descriptors: (*Manganese oxides, *Exchange interactions), (*Manganese fluorides, Exchange interactions), (*Iron compounds, Exchange interactions), (*Zinc fluorides, Exchange interactions), Energy levels, Far infrared radiation, Grueneisen constant, High pressure, Magnetism, Pressure dependence, Spectral shift, Spin, Ultralow temperature, Very high pressure, Cations, Doped materials.

For abstract, see NSA 28 07, number 17752.

COO-3151-23/GA PC$3.00/MF$1.45
Cornell Univ., Ithaca, N. Y. Lab. Of Atomic and Solid State Physics.
HYDROSTATIC PRESSURE DEPENDENCE OF THE KBR U-CENTER SIDE BANDS.
W. J. Shotts, and A. J. Sievers. Apr 73, 9p
Contract AT(11-1)-3151

Descriptors: (*Potassium bromides, *U centers), Absorption spectra, Far infrared radiation, Grueneisen constant, High pressure, Infrared spectra, Phonons, Pressure dependence, Very high pressure, Very low temperature.

For abstract, see NSA 28 07, number 17754.

COO-3158-22/GA PC$3.00/MF$1.45
Cornell Univ., Ithaca, N. Y. Materials Science Center.
THEORY OF DIFFUSE X-RAY SCATTERING BY INTERSTITIALS IN BCC METALS.
R. Benedek, and P. S. Ho. Jun 73, 16p
Contract AT(11-1)-3158

Descriptors: (*Tungsten, *Interstitials), (*Metals, Interstitials), (*X radiation, *Scattering), Bcc lattices, Green function.

For abstract, see NSA 28 07, number 16003.

FRNC-TH-361/GA PC$6.25/MF$1.45
Grenoble Univ. (France).
STUDY OF VACANCY CLUSTERS IN THE FORM OF VOIDS USING ELECTRON MICROSCOPY: NEUTRON IRRADIATED NIOBIUM, QUENCHED NICKEL.
C. Fischer. 1973, 81p
In French. U.S. Sales Only.

Descriptors: (*Niobium, *Physical radiation effects), (*Nickel, *Ion implantation), Electron microscopy, Voids, High temperature, Neutron beams, Solid clusters, Swelling, Temperature dependence, Vacancies, Very high temperature, Gases, Helium ions, Impurities, Quenching.

For abstract, see NSA 28 08, number 18877.

INP-816/GA PC$3.25/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
ATOMIC AND MAGNETIC STRUCTURE OF THE NI/SUB X/CU/SUB 1-X/ MNSB ALLOYS.
A. Szytula. 1972, 22p
U.S. Sales Only.

Descriptors: (*Nickel alloys, *Electronic structure), (*Copper alloys, Electronic structure), (*Manganese alloys, Electronic structure), (*Antimony alloys, Electronic structure), Chemical composition, Crystal structure, Curie point, Intermetallic compounds, Magnetic moments, Magnetic properties, Neutron diffraction, Quantity ratio, X-ray diffraction.

For abstract, see NSA 28 07, number 17765.

INP-827/GA PC$3.25/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
ELECTRIC FIELD GRADIENTS IN CHARGE DEFECTED LATTICES.
A. J. Pustowka, B. D. Sawicka, and J. A. Sawicki. Mar 73, 22p
U.S. Sales Only.

Descriptors: (*Cubic lattices, *Electric fields), (*Hexagonal lattices, Electric fields), (*Solids, *Crystal defects), Computer calculations, Differential pac, Impurities, Nuclei, Time dependence.

For abstract, see NSA 28 08, number 20617.

INP-828/GA PC$3.00/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
MOESSBAUER STUDY OF EXP 57 FE IMPLANTED IN SILICON.
J. A. Sawicki, B. D. Sawicka, S. Lazarski, and E. Maydell-Ondrusz. Feb 73, 11p
U.S. Sales Only.

Descriptors: (*Silicon, *Ion implantation), (*Iron 57, *Moessbauer effect), Absorption spectra, Absorption spectroscopy, Monocrystals, Structural chemical analysis.

For abstract, see NSA 28 08, number 20618.

IS-T-587/GA PC$5.75/MF$1.45
Ames Lab., Iowa.
LATTICE DYNAMICS OF GALLIUM ANTIMONIDE.
M. K. Farr. May 73, 73p
Contract W-7405-eng-82

Descriptors: (*Gallium alloys, *Crystal lattices), (*Antimony alloys, Crystal lattices), Coherent scattering, Dispersion relations, Inelastic scattering, Lattice parameters, Medium temperature, Specific heat, Temperature dependence, Thermal neutrons.

For abstract, see NSA 28 07, number 17766.

IS-T-592/GA PC$6.25/MF$1.45
Ames Lab., Iowa.
THERMAL EXPANSION OF SOLID NEON FROM 1 TO 15 K.
J. C. Holste. May 73, 85p
Contract W-7405-eng-82

Descriptors: (*Neon, *Thermal expansion), Binding energy, Grueneisen constant, Solids, Temperature dependence, Thermodynamic properties, Ultralow temperature, Very low temperature.

For abstract, see NSA 28 07, number 17767.

JINR-E4-7146/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
ENERGY OF MAGNETIC EXCITATIONS AND MAGNETIZATION IN COMPRESSIBLE FERROMAGNET.
F. R. Vukajlovic, and J. P. Vlahov. 1973, 15p
U.S. Sales Only.

Descriptors: (*Ferromagnetic materials, *Crystals), Equations, Green function, Hamiltonians, Interactions, Lattice parameters, Low temperature, Magnons, Phonons, Spin, Temperature dependence, Thermal expansion.

For abstract, see NSA 28 07, number 17768.

JINR-P4-7205/GA PC$3.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
EXACTLY SOLVABLE MODEL WITH INTERACTION OF PARTICLES OF DIFFERENT KINDS.
I. G. Brankov, and A. S. Shumovskii. 1973, 11p
In Russian. U.S. Sales Only.

Descriptors: (*Particles, *Interactions), Antiferromagnetic materials, Antiferromagnetism, Mathematical models.

For abstract, see NSA 28 07, number 17769.

KFKI-73-4/GA PC$3.00/MF$1.45
Magyar Tudomanyos Akademia Kozponti Fizikai Kutato Intezete, Budapest.
STUDY OF THE KONDO STATE IN ALMN ALLOY BY THERMAL NEUTRON SCATTERING.
N. Kroo, and Zs. Szentirmay. Apr 73, 12p
U.S. Sales Only.

Descriptors: (*Aluminium base alloys, *Kondo effect), (*Manganese alloys, Kondo effect), Neutrons, Scattering.

For abstract, see NSA 28 07, number 17772.

LA-UR-73-391/GA PC$3.00/MF$1.45
Los Alamos Scientific Lab., N. Mex.
COMPRESSIVE LOAD-DEFLECTION CHARACTERISTICS OF SEVERAL MATERIALS AT ROOM TEMPERATURE, 77 K AND 4.2 K.
W. F. Stewart, D. T. Eash, and W. A. May. 1972, 20p CONF-730805-5
Contract W-7405-eng-36

Descriptors: (*Superconducting magnets, *Supports), (*Magnets, Supports), Compression, Cryostats, Polystyrene, Polyurethanes, Silicones, Siloxanes.

For abstract, see NSA 28 08, number 19771.

N73-30188/9GA PC$3.00/MF$1.45
Talladega Coll., Ala.
THE EFFECT OF SURFACE CONDITIONS ON THE WORK FUNCTION OF INSULATORS AND SEMICONDUCTORS.
Annual Report, 1972 - 1973.
A. George. 2 Sep 73, 5p NASA-CR-133827
Contract NGR-01-007-001

Descriptors: *Ionization potentials, *Organic semiconductors, *Single crystals, Capacitors, Electric fields, Electronic equipment tests, Electrostatics, Gravitation.

For abstract, see STAR 1121

N73-30667/2GA PC$3.50/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
ELECTRICAL CONDUCTIVITY OF MATERIALS AND DETERMINATION OF THE RESISTIVITY.
M. V. Bachkovskiy, B. D. Besov, V. A. Novikova, and N. F. Olofinskiy. Sep 73, 28p NASA-TT-F-15067
Contract NASW-2481
Tran-Transl. Into English from Publ. "Teoriya Praktika Elektricheskikh I Magniticheskikh Metodov Separatsii Polezykh Iskopayemykh" Moscow, Nauka, 1968 p 57-76.

Descriptors: *Electric conductors, *Electrical resistivity, Dielectrics, Electrodes, Electron transitions, Semiconductors (Materials).

For abstract, see STAR 1121

N73-30715/9GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTAL INVESTIGATION OF RESONANCE SELF-SHIELDING AND THE DOPPLER EFFECT IN URANIUM AND TANTALUM.
Final Report.
T. Y. Byoun, R. C. Block, and T. T. Semler. Jun 72, 36p NASA-TM-X-69565
Contract NGR-33-018-134
Subm-Submitted for Publication.

Descriptors: *Doppler effect, *Tantalum, *Temperature effects, *Uranium, Breeder reactors, Distribution functions, Reactor technology, Resonance scattering, Temperature gradients.

For abstract, see STAR 1121

N73-31091/4GA PC$3.50/MF$1.45
National Aeronautics and Space Administration, Washington, D.C.
SOME REFLECTIONS CONCERNING MAGNETIC RESONANCE PHENOMENA IN THE DOMAIN OF RADIO FREQUENCIES.
A. Kastler. Sep 73, 29p NASA-TT-F-14733
Tran-Transl. Into English from Experientia, (Basel, V. 8/1, 1952 p 1-9. Conf-Presented at the Intern. Conf. On Spectry., Basel, 28-30 Jun. 1951.

Descriptors: *Magnetic resonance, *Radio frequencies, Magneto-optics, Paramagnetism, Phosphorescence, Photomagnetic effects, Polarization (Spin alignment).

For abstract, see STAR 1122

N73-31450/2GA PC$3.50/MF$1.45
Southern Univ., Baton Rouge, La. Dept. of Mechanical Engineering.
BIDIRECTIONAL REFLECTANCE OF ZINC OXIDE.
Quarterly Progress Report.
R. Scott. Aug 73, 28p NASA-CR-135494
Contract NGR-19-005-009

Descriptors: *Infrared spectra, *Spectral reflectance, *Ultraviolet spectra, *Zinc oxides, Detectors, Radiative heat transfer, Reflectometers.

For abstract, see STAR 1122

N73-31509/5GA PC$6.25/MF$1.45
Vacuumschmelze G.m.b.H., Hanau (West Germany). Entwicklungsabteilung.
SUPERCONDUCTING MATERIALS FOR AC-MAGNETS WITH RISETIME OF MAGNETIC FIELD IN THE RANGE OF SECONDS WERKSTOFFE FUER SUPRALEITENDE WECHSELFELDMAGNETE MIT UMMAGNETISIERUNGSZEITEN DER GROESSENORDNUNG SEKUNDE.
H. Hillmann. Apr 73, 83p BMFT-FB-T-73-03
Subm-Sponsored by Bundesmin. Fuer Forsch. Und Technol.
In German; English Summary.

Descriptors: *Alternating current, *Composite materials, *High field magnets, *Superconducting magnets, Copper, Copper alloys, Nickel alloys, Niobium alloys, Titanium alloys.

For abstract, see STAR 1122

N73-31674/7GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
THE HOMOGENEITY REGIONS OF THE SUPERCONDUCTIVE PHASES IN THE MOLYBDENUM-PLATINUM SYSTEM.
R. Flukiger. Oct 73, 5p NASA-TT-F-15139
Contract NASW-2481
Tran-Transl. Into English from J. Less Common Metals (Lausanne), V. 32, No. 2 Aug. 1973 p 222 and 224.

Descriptors: *Molybdenum alloys, *Platinum alloys, *Superconductivity, Annealing, Microhardness, Microstructure.

For abstract, see STAR 1122

N73-31676/2GA PC$4.25/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
SUPERCONDUCTIVE ENERGY STORAGE.
S. L. Wipf. Sep 73, 43p NASA-TT-F-15109, IPP-2/211
Contract NASW-2481
Tran-Transl. Into English of "Supraleitende Energiespeicher", Max-Planck-Inst. Fuer Plasmaphys., Garching, West Germany, Report Ipp-2/211, Feb. 1973 39 p.

Descriptors: *Energy storage, *Superconductivity, Lasers, Plasma pinch, Power supplies.

For abstract, see STAR 1122

N73-31680/4GA PC$5.75/MF$1.45
Siemens-Schuckertwerke A.G., Erlangen (West Germany). Forschungslab. Strahlungsmesstechnik.
NEW SEMICONDUCTORS FROM ELEMENTS WITH HIGH ATOMIC NUMBER FOR THE DETECTION OF GAMMA-RAYS AND X-RAYS NEUE HALBLEITER AUS ELEMENTEN MIT HOHER KERNLADUNGSZAHL ZUM NACHWEIS VON GAMMA-UND ROENTGENSTRAHLEN.
W. R. Willig. Apr 73, 74p BMFT-FB-K-73-09
Subm-Sponsored by Bundesmin. Fuer Forsch. Und Technol.
In German; English Summary.

Descriptors: *Gamma rays, *Radiation detectors, *Semiconductor devices, *X rays, Carrier mobility, Crystal growth, Iodides, Lead compounds, Lead oxides, Life (Durability), Mercury compounds, Single crystals, X ray spectroscopy.

For abstract, see STAR 1122

ORO-3087-51/GA PC$3.00/MF$1.45
Louisiana State Univ., Baton Rouge. Dept. Of Physics and Astronomy.
CONDUCTIVITY TENSORS IN METALS AND SEMICONDUCTORS. FINAL REPORT.
J. M. Reynolds. 1972, 14p
Contract AT(40-1)-3087

Descriptors: (*Metals, *Physical properties), (*Semiconductor materials, Physical properties), Fermi level, Knight shift, Magnetoresistance, Research programs, Thermal conductivity.

For abstract, see NSA 28 08, number 20635.

ORO-3800-8/GA PC$3.00/MF$1.45
Maryland Univ., College Park.
CONDUCTION ELECTRONS AND MAGNETISM. FINAL REPORT, MAY 1, 1968--APRIL 30, 1972.
J. R. Anderson, and S. M. Bhagat. 1972, 16p
Contract AT(40-1)-3800

Descriptors: (*Iron, *Spin waves), (*Nickel, Spin waves), (*Cobalt, Spin waves), (*Nickel alloys, Spin waves), Hcp lattices, Relaxation, Absorption, Copper alloys, Microwave radiation, Resonance, De haas-van alphen effect, Electronic structure.

For abstract, see NSA 28 07, number 17793.

RCN-185/GA PC$10.25/MF$1.45
Reactor Centrum Nederland, Petten.
STUDY OF EXCITATIONS IN FERROMAGNETIC NICKEL.
E. Frikkee. May 73, 163p
U.S. Sales Only.

Descriptors: (*Nickel, *Crystal lattices), (*Thermal neutrons, *Inelastic scattering), Cross sections, Dispersion relations, Electrons, Excitation, Ferromagnetic materials, Group theory, Interactions, J-j coupling, L-s coupling, Lattice vibrations, Magnons, Neutron beams, Phonons, Selection rules.

For abstract, see NSA 28 08, number 20636.

SCL-DC-720218/GA PC$4.25/MF$1.45
Sandia Labs., Livermore, Calif.
EFFECTS OF RADIATIVE HEAT TRANSFER UPON THE MELTING AND SOLIDIFICATION OF SEMI-TRANSPARENT CRYSTALS.
M. Abrams, and R. Viskanta. Feb 73, 41p CONF-730803-1
Contract AT(29-1)-789

Descriptors: (*Crystals, *Melting), Crystal growth, Equilibrium, Mathematical models, Phase transformations, Radiant heat transfer, Solidification, Thermal radiation.

For abstract, see NSA 28 07, number 17801.

SGAE-2092/GA PC$3.50/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Physik-Institut.
MAGNETIC FORM FACTORS OF NI--FE ALLOYS.
L. Dobrzynski, O. J. Eder, F. Maniawski, A. Modrzejewski, and E. Rossmanith. Feb 73, 27p
U.S. Sales Only.

Descriptors: (*Nickel base alloys, *Magnetic properties), (*Iron alloys, Magnetic properties), Chemical composition, Electronic structure, Form factors, Magnetism, Neutron diffraction, Polarization, Quantity ratio, Spin.

For abstract, see NSA 28 07, number 17802.

SLA-73-283/GA PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
MEASUREMENTS OF LOSS MODULI THROUGH VISCOUS HEATING EXPERIMENTS.
W. N. Sullivan, and H. C. Hardee. Jul 73, 13p

Descriptors: (*Solids, *Elasticity), Measuring methods, Strains, Temperature dependence, Viscosity.

For abstract, see NSA 28 08, number 20642.

SLL-73-5266/GA PC$3.50/MF$1.45
Sandia Labs., Livermore, Calif.
HELIUM RE-EMISSION AND SURFACE DEFORMATION IN NIOBIUM, VANADIUM, AND MOLYBDENUM.
W. Bauer, and G. J. Thomas. Jun 73, 28p CONF-730813-6
Contract AT(29-1)-789

Descriptors: (*Niobium, *Ion implantation), (*Vanadium, Ion implantation), (*Molybdenum, Ion implantation), (*Helium, *Emission), Atoms, Bubbles, Crystal defects, Deformation, Electron microscopy, Gases, Helium ions, Kev range 100-1000, Temperature dependence.

For abstract, see NSA 28 08, number 18879.

TID-26355/GA PC$3.00/MF$1.45
State Univ. Of New York, Stony Brook.
THERMAL NEUTRON SCATTERING ON MAGNETIC MATERIALS AND LIQUIDS.
R. Nathans. 1972, 8p
Contract AT(30-1)-4084

Descriptors: (*Magnetic materials, *Neutron transport), (*Thermal neutrons, *Scattering).

For abstract, see NSA 28 07, number 17817.

20M. Thermodynamics

AD-768 439/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
METHOD OF CALCULATING THREE-DIMENSIONAL STATIONARY TEMPERATURE FIELDS OF SOLID BODIES,
A. A. Telegin. 19 Sep 73, 12p Rept no. FTD-HT-23-192-74
Edited trans. of Samoletostroenie i Tekhnika Vozdushnogo Flota (USSR) n25 p126-130 1971, by Kathleen L. Dion.

Descriptors: (*Temperature, Solids), (*Thermal conductivity, Solids), USSR.
Identifiers: Translations, Computation.

The article presents a method for calculating the three-dimensional stationary temperature fields of solid bodies in the presence of a concentrated heat source. It has been developed as an extension of new principles based on the author's proposed kinetic-photon interpretation of the thermal conductivity mechanism.

AD-768 602/5GA Reprint
California Univ San Diego La Jolla Dept of Physics
THERMAL CONTACT BETWEEN NA3(CE(C7H3NO4)3) 15H2O AND LIQUID 3HE AT MILLIKELVIN TEMPERATURES,
J. H. Bishop, and A. C. Mota. 26 Feb 73, 4p
AFOSR-TR-73-1806
Contract F44620-72-C-0017
Availability: Pub. in the Jnl. of Physics Letters, v43A n6 p511-512 1973.

Descriptors: (*Thermal conductivity, *Cerium compounds), Organic nitrogen compounds, Interfaces, Metalorganic compounds, Liquefied gases, Helium, Cryogenics, Salts.
Identifiers: Liquid helium, Helium 3, Helium 4.

Very short thermal equilibrium times have been observed at millikelvin temperatures between powdered Na3(Ce(C7H3NO4)3) . 15H2O, and pure 3He. Both a large increase in these times and a change in their temperature dependence occurs when 1% 4He is added. (Author)

AEEW-M-976/GA PC$3.75/MF$1.45
Atomic Energy Establishment, Winfrith (England).
QUENCHING OF A HEATED SURFACE BY A FILM OF WATER IN A STEAM ENVIRONMENT AT PRESSURES UP TO 53 BAR.
D. F. Elliott, and P. W. Rose. Jul 70, 31p
U.S. Sales Only.

Descriptors: (*Surfaces, *Wettability), (*Water, Surfaces), Films, Fluid flow, Heat transfer, Heating, Medium pressure, Pressure dependence, Steam, Surface properties.

For abstract, see NSA 28 07, number 15431.

KFKI-73-11/GA PC$3.50/MF$1.45
Magyar Tudomanyos Akademia Kozponti Fizikai Kutato Intezete, Budapest.
POOL BOILING HEAT TRANSFER.
L. Maroti. Mar 73, 27p
U.S. Sales Only.

Descriptors: (*Nucleate boiling, *Heat transfer), Bubble growth, Liquids.

For abstract, see NSA 28 08, number 20620.

KFKI-73-12/GA PC$3.00/MF$1.45
Magyar Tudomanyos Akademia Kozponti Fizikai Kutato Intezete, Budapest.
POOL BOILING CRISIS.
L. Maroti. Mar 73, 16p
U.S. Sales Only.

Descriptors: (*Pool boiling, *Critical heat flux), Heat transfer, Nucleate boiling.

For abstract, see NSA 28 07, number 15434.

N73-30879/3GA PC$7.00/MF$1.45
Scripta Technica, Inc., Washington, D.C.
PROBLEMS OF HEAT TRANSFER IN SPACE.
O. N. Favorskiy, and Y. S. Kadaner. Aug 73, 303p NASA-TT-F-783
Contract NASW-2484
Tran-Transl. Into English from the Book "Voprosy Teploobmena V Kosmose" Moscow, Vysshaya Shkola, 1972 280 p.

Descriptors: *Aerospace environments, *Cooling systems, *Heat radiators, *Heat transfer, *Thermal radiation, Extraterrestrial radiation, Heat pipes, Planetary radiation.

For abstract, see STAR 1121

N73-31237/3GA PC$3.75/MF$1.45
Tokyo Univ. (Japan). Inst. of Space and Aeronautical Science.
AN EXACT SOLUTION ON THE PROPAGATION OF SMALL DISTURBANCES IN A RADIATING GREY GAS WITH ISOTROPIC SCATTERING.
M. Murakami, and K. Oshima. Jun 73, 32p ISAS-494-VOL-38-NO-5

Descriptors: *Gray gas, *Isotropic turbulence, *Wave propagation, Gas mixtures, Gas-solid interfaces, Harmonic oscillation, Heat flux, Plane waves, Singular integral equations.

For abstract, see STAR 1122

N73-31827/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
HEAT PIPE INVESTIGATIONS.
J. P. Marshburn. Aug 73, 49p NASA-TN-D-7219, G-7311

Descriptors: *Heat pipes, *Heat transfer, *Thermal vacuum tests, Atlas centaur launch vehicle, Equations of motion.

For abstract, see STAR 1122

N73-31834/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
HEAT PIPE STABILITY. 1: A PRELIMINARY INVESTIGATION INTO THERMALLY ASSISTED CAVITATION.
Jul 73, 19p NASA-TM-X-70458, X-764-73-224

Descriptors: *Capillary flow, *Heat pipes, Menisci, Thermodynamics, Working fluids.

For abstract, see STAR 1122

N73-31839/6GA PC$4.50/MF$1.45
Colorado State Univ., Fort Collins. Dept. of Electrical Engineering.
ELECTROHYDRODYNAMIC HEAT PIPE RESEARCH.
T. B. Jones, and M. P. Perry. Jul 73, 49p NASA-CR-114646, RR-4
Contract NGR-06-002-127

Descriptors: *Electrohydrodynamics, *Heat pipes, Burnout, Evaporators, Hydrodynamic equations, Thermal conductivity.

For abstract, see STAR 1122

SGAE-2117/GA PC$6.25/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf.
STUDIES ON HEAT TRANSFER. 6. PROGRESS REPORT, 1972.
H. Schmidl. Apr 73, 83p
In German. U.S. Sales Only.

Descriptors: (*Heat transfer, *Turbulent flow), Navier-stokes equation, Prandtl number, Tubes.

For abstract, see NSA 28 08, number 18159.

SLA-73-673/GA PC$3.50/MF$1.45
New Mexico Univ., Albuquerque.
COOLING OF NEWTONIAN AND NON-NEWTONIAN FLUIDS WITH TEMPERATURE-DEPENDENT VISCOSITY.
G. F. Cochrane. Dec 72, 29p

Descriptors: (*Fluids, *Heat transfer), Computer calculations, Cooling, Medium pressure, Pipes, Pressure gradients, Temperature dependence, Viscosity.

For abstract, see NSA 28 08, number 20646.

SLL-73-249/GA PC$7.25/MF$1.45
Sandia Labs., Livermore, Calif.
FINITE CONDUCTANCE ELEMENT METHOD OF CONDUCTION HEAT TRANSFER.
E. C. Lemmon. Jun 73, 103p
Contract AT(29-1)-789

Descriptors: (*Heat transfer, *Finite element method), (*Solids, Heat transfer), Finite difference method, Surfaces.

For abstract, see NSA 28 08, number 20650.

20N. Wave Propagation

N73-31092/2GA PC$3.00/MF$1.45
California Univ., Los Angeles. Plasma Physics Group.
RELATIVISTIC PARTICLE MOTION IN NONUNIFORM ELECTROMAGNETIC WAVES.
G. Schmidt, and T. Wilcox. Jun 73, 14p NASA-CR-133888, PPG-152
Contracts NGL-05-007-190, N00014-69-A-0200-4023

Descriptors: *Electromagnetic radiation, *Nonuniformity, *Particle motion, *Relativistic particles, Light beams, Particle acceleration, Plane waves.

For abstract, see STAR 1122

N73-31100/3GA PC$3.75/MF$1.45
Fernmeldetechnisches Zentralamt, Darmstadt (West Germany).
SCATTERING CAUSED BY PRECIPITATION IN THE MILLIMETER WAVELENGTH RANGE. RESULTS OF CALCULATIONS.
F. Dintelmann, and F. Ruecker. Jan 72, 32p FTZ-A-455-TBR-35
In German; English Summary.

Descriptors: *Electromagnetic wave transmission, *Microwave scattering, *Mie scattering, *Precipitation (Meteorology), *Scattering cross sections, Millimeter waves, Radio relay systems, Raindrops, Refractivity, Spheres, Superhigh frequencies.

For abstract, see STAR 1122

21. PROPULSION AND FUELS

21A. Air-Breathing Engines

N73-30750/6GA PC$3.50/MF$1.45
British Aircraft Corp., Weybridge (England). Commercial Aircraft Div.
AN AIRCRAFT DESIGNER'S REVIEW OF SOME AIRFRAME AND ENGINE INTEGRATION CONCEPTS.
P. R. G. Williams, and D. J. Stewart. 23 Jun 72, 26p
Conf-Presented at 1ST Intern. Symp. On Air Breathing Engines, Marseille, France, 19-23 Jun. 1972.

Descriptors: *Aircraft engines, *Fuselages, Afterbodies, Air breathing engines, Airframes.

For abstract, see STAR 1121

21B. Combustion and Ignition

AD-768 476/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A METHOD FOR THE AUTOMATIC CONTROL OF THE COMBUSTION PROCESS,
B. S. Fyalkov, V. T. Plitsyn, G. P. Senkevich, and Ya. I. Magun. 11 Oct 73, 8p Rept no. FTD-HT-23-593-74
Edited trans. of Patent (USSR) 343 116 p1-2, 22 Jun 72, by Ray E. Zarza.

Descriptors: (*Combustion, Control systems), (*Fuels, Combustion), Patents, USSR, Automation, Acoustics, Vibration, Solid rocket propellants, Burning rate.
Identifiers: Translations, Signal processing, Automatic control.

The report describes a Russian patent relative to automatic control of a combustion process by means of an acoustic field signal processor.

AD-768 615/7GA PC$7.00/MF$1.45
Georgia Inst of Tech Atlanta School of Aerospace Engineering
COMBUSTION GENERATED NOISE IN TURBOPROPULSION SYSTEMS.
Interim technical rept.,
B. N. Shivashankara, J. C. Handley, and W. C. Strahle. 24 Jul 73, 96p AFOSR-TR-73-1899
Grant AF-AFOSR-2365-72

Descriptors: (*Combustion, Acoustics), (*Jet engine noise, Combustion), Flames, Turbulence, Jet flames, Afterburning, Power spectra, Screaming combustion, Experimental data.
Identifiers: Combustion noise, Scaling laws, Noise suppression, Noise pollution, Acoustic radiation.

Experiments on noise radiation by open turbulent premixed flames are described. Detailed directionality distributions, scaling rules for acoustic power radiated, thermo-acoustic efficiency and spectral content are presented and discussed. Scaling rules for reacting volume are generated by a direct flame photography technique. These experiments are shown to be quite useful in decomposing combustion noise scaling laws. The acoustic power is shown to scale as U(2.7) D(2.8) SL(1.4) F(0.4), and combustion noise spectra peak in the 250-700 Hz range. The directionality is quite weak for noise from open turbulent flames. The experimental results are critically examined in the light of the theoretical predictions from Strahle's theory of combustion noise. (Author)

N73-30881/9GA PC$4.25/MF$1.45
Deutsche Forschungsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany).
IGNITION OF GASEOUS HYDROCARBON FUELS IN HYPERSONIC RAMJETS.
F. Suttrop. 23 Jun 73, 45p
Conf-Presented at 1ST Intern. Symp. On Air Breathing Engines, Marseille, France, 19-23 Jun. 1972.

Descriptors: *Combustion physics, *Flammability, *Hydrocarbon fuels, *Ignition limits, Acetylene, Ethylene, Materials tests, Methane, Propane.

For abstract, see STAR 1121

N73-31828/9GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ANALYTICAL AND EXPERIMENTAL STUDY OF SUPERSONIC COMBUSTION OF HYDROGEN IN A VITIATED AIRSTREAM.
M. C. Burrows, and A. P. Kurkov. Sep 73, 25p NASA-TM-X-2828, E-6319

Descriptors: *Gas injection, *Hydrogen, *Hypersonic flow, *Supersonic combustion, Heat sinks, Wall jets.

For abstract, see STAR 1122

N73-31838/8GA PC$3.25/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
THE CALCULATION OF FLAME TEMPERATURES AT CONSTANT PRESSURE AND CONSTANT VOLUME.
L. W. Hillen. Feb 73, 24p ARL/ME-NOTE-341

Descriptors: *Combustion temperature, *Flame temperature, Pressure, Propane, Volume.

For abstract, see STAR 1122

PATENT-3 517 170/GA Not available NTIS
Department of the Navy Washington D C
SYSTEM OR APPARATUS FOR OPTIMIZING THE OPERATION OF A COMBUSTION PROCESS.
Patent,
James W. Banham, Jr. Filed 29 May 67, patented 23 Jun 70, 4p Rept nos. PAT-APPL-627 590,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Combustion, Gas flow), (*Patents, Combustion), Particles, Light transmission, Instrumentation, Air, Control.
Identifiers: Air fuel ratio, PAT-CL-235-151-12, Smoke.

The patent relates to a unique apparatus in which a corrective electrical signal developed from the relative opaqueness of the products of combustion in a combustion process is used to regulate and control the input air-fuel ratio of the combustion process. The apparatus includes adjustable timing circuitry that intermittently activates and deactivates a summing amplifier. The summing amplifier provides an output signal that represents the difference between a preset potential and a potential proportional to the density of the smoke of the combustion process. The difference or error output signal of the summing amplifier is then used to control the input air-fuel ratio of the combustion process.

21C. Electric Propulsion

N73-30738/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CONTROL OF A 30 CM DIAMETER MERCURY BOMBARDMENT THRUSTER.
F. F. Terdan, and R. T. Bechtel. 1973, 20p NASA-TM-X-68297, E-7648
Conf-Proposed for Presentation at the 10TH Elec. Propulsion Conf., Lake Tahoe, Nev., 31 Oct.-2 Nov. 1973; Sponsored by Aiaa.

Descriptors: *Electric propulsion, *Feedback control, *Ion propulsion, *Mercury (Metal), Magnetic coils, Neutralizers, Voltage generators.

For abstract, see STAR 1121

N73-30739/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
INVESTIGATION OF HOLLOW CATHODE PERFORMANCE FOR 30-CM THRUSTERS.
M. J. Mirtich. 1973, 11p NASA-TM-X-68298, E-7649
Conf-Proposed for Presentation at the 10TH Elec. Propulsion Conf., Lake Tahoe, Nev., 31 Oct.-2 Nov. 1973; Sponsored by Aiaa.

Descriptors: *Hollow cathodes, *Performance tests, *Rocket engines, Emissivity, Flow velocity, Fluid flow, Insertion, Mercury (Metal), Orifices, Temperature measurement, Vacuum chambers.

For abstract, see STAR 1121

N73-30740/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXHAUST PRESSURE AND DENSITY OF VARIOUS PULSED MPD-ARC THRUSTER SYSTEMS.
C. J. Michels. 1973, 9p NASA-TM-X-68299, E-7650
Conf-Proposed for Presentation at 10TH Elec. Propulsion Conf., Lake Tahoe, Nev., 31 Oct. - 2 Nov. 1973; Sponsored by Aiaa.

Descriptors: *Electric propulsion, *Electron density (Concentration), *Exhaust systems, *Impact loads, *Rocket engines, Pulsed jet engines, Vacuum chambers.

For abstract, see STAR 1121

N73-30741/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A 9700-HOUR DURABILITY TEST OF A FIVE CENTIMETER DIAMETER ION THRUSTER.
S. Nakanishi, and R. C. Finke. 1973, 17p NASA-TM-X-68284, E-7624
Conf-Proposed for Presentation at Propulsion Specialist Conf., Lake Tahoe, Nev., 29 Oct.-2 Nov. 1973.

Descriptors: *Engine tests, *Ion engines, *Rocket engines, *Service life, Altitude control, Anodes, Cathodes, Electron bombardment, Neutralizers, Stationkeeping, Vacuum chambers.

For abstract, see STAR 1121

N73-30742/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SERT 2 HOLLOW CATHODE MULTIPLE RESTARTS IN SPACE.
W. R. Kerslake, and R. C. Finke. 1973, 11p NASA-TM-X-68292, E-7638
Conf-Proposed for Presentation at the 10TH Elec. Propulsion Conf., Lake Tahoe, Nev., 31 Oct.-2 Nov. 1973; Sponsored by Aiaa.

Descriptors: *Hollow cathodes, *Restartable rocket engines, *Sert 2 spacecraft, Aerospace engineering, Electric propulsion, Ground tests, Operating temperature, Reliability engineering, Space storage.

For abstract, see STAR 1121

N73-30743/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A HOLLOW CATHODE NEUTRALIZER FOR A 30-CM DIAMETER BOMBARDMENT THRUSTER.
R. T. Bechtel. 1973, 14p NASA-TM-X-68291, E-7578
Conf-Proposed for Presentation at the 10TH Elec. Propulsion Conf., Lake Tahoe, Nev., 31 Oct. - 2 Nov. 1973; Sponsored by Aiaa.

Descriptors: *Hollow cathodes, *Neutralizers, *Rocket engines, Electric current, Equipment specifications, Operations research, Performance tests, Rocket engine design, Tube grids.

For abstract, see STAR 1121

N73-30744/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PERFORMANCE OF 30-CM ION THRUSTERS WITH DISHED ACCELERATOR GRIDS.
V. K. Rawlin. 1973, 17p NASA-TM-X-68294, E-7642
Conf-Proposed for Presentation at the 10TH Elec. Propulsion Conf., Lake Tahoe, Nev., 31 Oct.-2 Nov. 1973.

Descriptors: *Engine design, *Ion engines, *Parabolic reflectors, *Performance tests, *Rocket engines, Acceleration (Physics), Baffles, Cathodes, Magnetic fields, Magnetic measurement.

For abstract, see STAR 1121

N73-30748/0GA PC$5.25/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Mission Analysis Div.
SEP THRUST SUBSYSTEM PERFORMANCE SENSITIVITY ANALYSIS.
K. L. Atkins, C. G. Sauer, Jr., and D. J. Kerrisk. 15 Aug 73, 61p NASA-CR-133792, JPL-TM-33-611
Contract NAS7-100

Descriptors: *Propulsion system performance, *Solar electric propulsion, *Thrust, Encke method, Mission planning, Satellite orbits, Spacecraft trajectories.

For abstract, see STAR 1121

N73-30882/7GA PC$4.00/MF$1.45
Cranfield Inst. of Technology (England). School of Mechanical Engineering.
CURRENT PROBLEMS AND TRENDS IN GAS TURBINE COMBUSTION.
A. H. Lefebvre. 1972, 38p
Conf-Presented at 1ST Intern. Symp. On Air Breathing Engines, Marseille, France, 19-23 Jun. 1972.

Descriptors: *Combustion control, *Combustion efficiency, *Engine design, *Gas turbine engines, Combustion physics, Exhaust gases, Propulsion system performance, Systems analysis.

For abstract, see STAR 1121

N73-31694/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AN 8-CM ELECTRON BOMBARDMENT THRUSTER FOR AUXILIARY PROPULSION.
W. R. Hudson, and B. A. Banks. 1973, 13p NASA-TM-X-68296, E-7645
Conf-Proposed for Presentation at the 10TH Elec. Propulsion Conf., Lake Tahoe, Nev., 31 Oct.-2 Nov. 1973; Sponsored by Aiaa.

Descriptors: *Auxiliary propulsion, *Electron bombardment, *Ion engines, Cathodes, Ion extraction, Thrust vector control.

For abstract, see STAR 1122

21D. Fuels

AD-768 696/7GA PC$3.00/MF$1.45
Army Mobility Equipment Research and Development Center Fort Belvoir Va
SURFACTANTS AND THEIR EFFECTS ON FILTER/SEPARATORS.
Technical rept.,
T. H. Jefferson, and S. B. Boulware. Jun 73, 31p
Rept no. USAMERDC-2066

Descriptors: (*Surface-active substances, Physical properties), (*Jet engine fuels, *Fuel contamination), Fuel filters, Separation, Static electricity.
Identifiers: Coalescing.

Surfactants (surface-active agents) in certain concentrations and combinations are known to have a harmful effect on filter/separators. They affect the basic physicochemical parameters associated with coalescence and the removal of solid particulate from hydrocarbon fuels. The basic parameters affected include cohesion, adhesion, contact angle, surface free energy, fuel velocity, electrostatic charge generation, and differential pressure across the coalescent media. Tests conducted on military filter/separators indicate that JP-4 and JP-5 jet fuel can be decontaminated properly; however, problems exist in the decontamination of water from Motor Gasoline (MoGas) and No. 2 Diesel fuel. Tests conducted to determine the effect of surfactants versus electrostatic charge generation indicate that small amounts of surfactants or combinations of surfactants and free water or solid particulates can convert a nearly inert fuel into a fuel producing high and dangerous levels of static electricity. (Author)

AD-769 054/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
DEVICE FOR FILLING A FUEL TANK WITH AN OIL-AND-GASOLINE MIXTURE,
V. I. Ilyukhin. 17 Oct 73, 5p Rept no. FTD-HT-23-613-74
Edited trans. of Patent (USSR) 255 070 p1-2 1969, by Rene E. Courville.

Descriptors: (*Refueling, Patents), (*Fuel tanks, Filling), USSR, Ducts, Oils, Gasoline, Mixtures.
Identifiers: Translations, Funnels.

The invention pertains to the field of machine-building and, in particular, to oil-and-gasoline mixture fueling devices. The proposed device differs from those which exist in that the neck is provided with a duct with a spherical reflector that is connected with the aid of spokes and is provided with an outlet convergent channel which forms a circular cavity with the funnel that joins the flow of the duct by holes made in it. This raises the homogeneity of the mixture and reduces refueling time.

COM-73-50844/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
PROPERTIES DATA FOR LNG.
Progress rept. 1970-1973,
D. E. Diller, and L. A. Sarkes. 1973, 2p
Sponsored in part by American Gas Association, Inc. Arlington, Va.
Pub. in American Gas Association Mon., v55 n9 p27-28 Sep 73.

Descriptors: (*Liquefied natural gas, Thermodynamic properties), Cryogenics, Physical properties, Propane, Methane, Ethane.

The need for new physical and thermodynamic properties data for liquefied natural gas (LNG) mixtures at low temperatures is discussed. A plan is given for calculating properties data for liquid mixtures at temperatures well below the critical temperature. The National Bureau of Standards Cryogenics Division's program to provide accurate input data for calculating properties data for LNG is described.

LA-UR-73-715/GA PC$3.75/MF$1.45
Los Alamos Scientific Lab., N. Mex.
LOGISTICS, ECONOMICS, AND SAFETY OF A LIQUID HYDROGEN SYSTEM FOR AUTOMOTIVE TRANSPORTATION.
W. F. Stewart, and F. J. Edeskuty. 1973, 31p
CONF-730917-1
Contract W-7405-eng-36

Descriptors: (*Hydrogen, *Synthetic fuels), (*Engines, *Fuels), Economics, Energy, Production, Safety, Storage, Transport.

For abstract, see NSA 28 08, number 20540.

N73-31689/5GA PC$3.75/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Munich (West Germany). Inst. fuer Flugtreib- und Schmierstoffe.
OPTIMIZATION OF C3 AND C4 OLEFIN OLIGOMER SUPERSONIC FUELS BY N-PARAFFINS OPTIMIERUNG VON UEBERSCHALLKRAFTSTOFFEN AUS OLIGOMERISATEN VON C3- UND C4-OLEFINEN DURCH N-PARAFFINE.
R. Erlmeier. 17 Jan 73, 31p DLR-FB-73-32
In German; English Summary.

Descriptors: *Aircraft fuels, *Alkenes, *Paraffins, *Supersonic aircraft, *Supersonic combustion, Combustion efficiency, Fuel combustion, Melting points, Polymers, Vapor pressure, Viscosity.

For abstract, see STAR 1122

PB-224 399/6GA PC$4.25/MF$1.45
Bureau of Mines, Washington, D.C.
BUREAU OF MINES ENERGY PROGRAM, 1972.
Information circular,
Bill Linville, and John D. Spencer. Aug 73, 117p
BuMines-IC-8612
Prepared in cooperation with Morgantown Energy Research Center, W. Va., and Bartlesville Energy Research Center, Okla. See also Energy Program 1971, PB-211 456.

Descriptors: (*Fuels, Research), (*Coal, Research), (*Crude oil, Research), (*Oil shale, Research), Oil recovery, Bituminous sands, In situ combustion, Shale oil, Environmental surveys, Energy, Coal gasification, Electric power generation, Coke, Carbonization, Coal mining, Safety, Natural gas.

During calendar year 1972, the Bureau of Mines was engaged in some 20 major areas of research for development of new and improved efficient methods of conservation and utilization for petroleum and natural gas, oil shale, and coal. Made up of numerous projects described in this report, the program was carried out through research centers and laboratories in the field supervised and supported by administrative personnel of this Bureau of the Department of the Interior. Based on this research, 186 technical reports were published by the Bureau or others, and numerous other reports were prepared for U.S. Government agencies, State agencies, and organizations engaged in cooperative research programs with the Bureau. (Author)

PB-224 482/9GA PC$4.75/MF$1.45
Division of Reactor Development and Technology (AEC), Washington, D.C.
HYDROGEN AND OTHER SYNTHETIC FUELS. A SUMMARY OF THE WORK OF THE SYNTHETIC FUELS PANEL.
Sep 72, 139p* TID-26136
Paper copy also available from GPO $2.25 as Y3.AT7:22/TID 26136.

Descriptors: (*Fuels, Reviews), (*Hydrogen, Fuels), Ammonia, Methyl alcohol, Hydrazine, Methane, Coal gasification, Cargo transportation, Fuel storage, Production, Utilization, Manufaced gas, Electric power generation.

The specific purpose of this panel's work may be summarized as follows: To assess the potential of an energy system based on nonfossil synthetic fuels, mainly hydrogen; to give special attention to the use of synthetic fuels for the dispersed, stationary generation of electricity; to examine all segments of a synthetic fuel system and make recommendations for performing any required research and development. The report covers all aspects of an energy system based on nonfossil synthetic fuels and includes discussions on the production of the fuels; their storage, transmission, and end uses; and an overall systems analysis illustrating the role these fuels might assume in the future. A section on the use of coal to produce hydrogen and methanol is also included to help define the interim time period before our dependency on nonfossil fuels occurs.

PB-224 493/7GA PC-GPO/MF$1.45-NTIS
Environmental Protection Agency, Washington, D.C. Office of Research and Monitoring.
ENERGY CONSERVATION STRATEGIES.
Socioeconomic environmental studies series,
Marquis R. Seidel, Steven E. Plotkin, and Robert O. Reck. Jul 73, 122p W74-00152, EPA-R5-73-021
Paper copy available from GPO $1.25 as stock no. EP1.23/3-73-021.

Descriptors: (*Energy, Conservation), Strategy, Requirements, Consumption, Demand(Economics), Cost analysis, Management analysis.

The report examines various strategies for reducing national energy demand. Suppose government chooses to reduce national energy use, and to do so in a cost-effective way. Then it is necessary to find out, for each potential energy saving, how much energy is involved and how costly the alternatives would be. The study begins by asking how much is now paid, or might be paid in the future, by various energy users. It emerges from the study that many users get much of their energy at relatively low prices, and are thus encouraged to waste it; the economist calls this price distortion, a form of market failure. The study analyzes the kinds of market failure which seem to cause the present energy crisis, the kinds of government action which could rectify these failures, and the likely response of the economy to moderate price increases. Numerous actions, some large and some small, would be required to restore a more efficient functioning of the market for energy. Some of these actions have already been initiated. In an efficient market, energy price increases of 25% would prompt a halving of the growth of energy demand; through 1990, energy needs would grow 40% rather than the 100% projected at current prices. (Author)

PB-224 530/6GA PC$3.00/MF$1.45
Office of Science and Technology. Washington, D.C. Overview Panel.
CLEAN FUELS FROM COAL,
Neal P.Cochran. 10 Nov 72, 15p

Descriptors: (*Coal, Conversion), Coal gas, Manufactured gas, Coal gasification, Desulfurization, Synthetic oils, Fuel oil, Hydrogenation, Economic analysis.

Detailed study of the production of clean synthetic fuels from coal results in recommendation for a total program of $1.51 billion. The work recommended is divided into a research phase at $33.4 million, a development phase at $315.0 million, and a demonstration phase at $1.15 billion. Work is outlined for alternate processes to produce clean low-Btu gas, clean liquid fuels, and clean solid fuels from coal. Supporting work on the development of special equipment and improved materials along with economic and engineering studies are proposed and funds provided in the budget estimates.

PB-224 571/0GA PC$2.75/MF$1.45
Bureau of Mines, Washington, D.C.
FLOTATION OF PYRITE FROM COAL: PILOT PLANT STUDY.
Rept. of investigations,
Kenneth J. Miller. Sep 73, 20p* BuMines-RI-7822
Prepared in cooperation with Pittsburgh Energy Research Center, Pa.

Descriptors: (*Coal, *Desulfurization), (*Pyrite, *Flotation), Froth, Pilot plants, Flotation reagents, Potassium organic compounds, Xanathates.

The report presents results of pilot plant flotation tests to remove pyritic sulfur from a Pittsburgh bed coal and Lower Freeport bed coal using a new two-stage flotation process developed by the U.S. Bureau of Mines. Pilot plant flotation test results were excellent comparing well with those obtained in the laboratory. Tabulated and graphic results are given along with a pilot plant flow-sheet and a photograph of the flotation cells in operation. (Author)

21E. Jet and Gas Turbine Engines

AD-768 436/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
DETERMINING THE BALANCING PARAMETER FOR A CORRECTING CIRCUIT OPERATING IN A GAS TEMPERATURE CONTROL SYSTEM OF A GAS-TURBINE AVIATION ENGINE,
Yu. N. Dotsenko, I. P. Pelepeichenko, and V. G. Volkov. 10 Oct 73, 11p Rept no. FTD-HT-23-178-74
Edited trans. of Samoletostroenie i Tekhnika Vozdushnogo Flota (USSR) n25 p46-50 1971, by Louise E. Heenan.

Descriptors: (*Thermocouples, Control systems), (*Aircraft engines, *Gas turbines), Temperature sensitive elements, Gas turbine nozzles, Heat transfer, Temperature, Gas flow, Measurement, USSR.
Identifiers: Translations, Signal processing.

The report describes a numerical method for determining gas flow rates and gas temperatures in order to balance control systems of gas turbine engines.

AD-768 474/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PROCEDURE FOR THE EXPERIMENTAL DETERMINATION OF THE DYNAMIC PARAMETERS OF A TURBOPROP ENGINE AS AN OBJECT OF R/M CONTROL,
P. P. Minin, and A. K. Ipatov. 10 Oct 73, 8p Rept no. FTD-HT-23-177-74
Edited trans. of Samoletostroenie i Tekhnika Vozdushnogo Flota (USSR) n25 p43-46 1971, by Paul J. Reiff.

Descriptors: (*Turboprop engines, Performance(Engineering)), Variable-pitch propellers, Spray nozzles, Fuel injection, Fuel injectors, Fuel consumption, Flowmeters, USSR.
Identifiers: Translations, Revolutions per minute.

The report presents a procedure for experimental determination of the dynamic parameters applicable to a Soviet, single-shaft turboprop engines and describes briefly the mandatory design changes which must be introduced into the engine system under consideration.

AD-768 492/1GA PC$5.50/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE TESTING OF JET ENGINES (CHAPTERS 5 AND 6),
L. S. Skubschevskii. 6 Sep 73, 68p Rept no. FTD-MT-24-345-73
Edited machine trans. of mono. Ispytaniya Vozdushno--Reaktivnykh Dvigatelei, n.p., 1972 p3-40, 56-123, 199-205, 223-224, by Frank C. Vaughn.

Descriptors: (*Jet engines, Test methods), Captive tests, Structural parts, Heat exchangers, Hydraulic brakes, Cooling, Design, USSR.
Identifiers: Translations.

The report describes the structural parts of jet engine test stands and explains the function of each part.

AD-768 850/0GA PC$5.75/MF$1.45
Boeing Commercial Airplane Co Seattle Wash
727 NOISE RETROFIT FEASIBILITY. VOLUME III. UPPER GOAL FLIGHT TESTING AND PROGRAM SUMMARY.
Final rept. Jul 71-Dec 72,
D. L. Hiatt, and M. B. McKaig. Jun 73, 227p* Rept no. D6-60196 FAA-RD-72-40-Vol-3
Contract DOT-FA71WA-2637
See also Volume 2, AD-763 596.

Descriptors: (*Jet engine noise, Acoustic impedance), (*Turbojet engines, Design), Commercial planes, Jet engine nacelles, Sandwich panels, Honeycomb cores, Turbojet exhaust nozzles, Acoustic insulation, Flight testing, Costs.
Identifiers: Boeing 727 aircraft, JT-8 engines, JT-8D engines, Noise suppressors, Noise reduction, Acoustic panels, Aircraft modification.

The work consisted of flight testing of the quiet-nacelle configuration developed in phase 2 in fulfillment of the FAA upper noise reduction goals for the 727 airplane, along with parallel flight testing of the 727 production nacelle as a baseline. All testing was performed on a model 727-100 airplane, with results extrapolated to the long-body 200 model. The phase 2 nacelles consist of peripheral acoustic lining in all inlets plus double-ring acoustic treatment in the side-engine inlets; acoustically treated engine fan ducts; and multilobe variable-geometry jet noise suppressors discharging through fixed, acoustically lined ejectors, with provision for automatic closure of the ejector inlets for cruise operation. Acoustic propulsion, and aerodynamic performance analyses were made, along with a study of the physical effects of integrating the phase 2 nacelle on both model 727s. A direct-operating-cost (DOC) analysis was prepared based on realistic retrofit installation cost estimates and airplane performance analyses. In addition, a study was made of engine and airframe options available for recovery of performance penalties incurred by installation of phase 2 nacelles. (Author)

AD-769 043/1GA PC$4.25/MF$1.45
Marquardt Co Van Nuys Calif
FEASIBILITY OF RAMJET ENGINE TEST CAPABILITY ON THE HOLLOMAN SLED TRACK.
Technical summary rept. May 71-Apr 73,
Lester E. McTaggart. Sep 73, 119p Rept no. MR-S1267 AFAPL-TR-73-80
Contract F33615-71-C-1372

Descriptors: (*Ramjet engines, Test methods), (*Rocket-propelled sleds, *Supersonic test vehicles), Feasibility studies, Aerodynamic loading, Stresses, Fuel systems, Mounting brackets, Flow fields, Cold flow tests.
Identifiers: Design criteria.

Under a joint program between the 6585 Test Group/TK and the Ramjet and Laser Aerodynamics Division of the Aero Propulsion Laboratory, an existing monorail test sled was modified to accept

the SCP/LASRM test vehicle. The necessary structural modifications were made to the SCP/LASRM hardware to withstand the applied loads imposed by the sled. The feasibility of ramjet engine test capability on the Holloman Sled Track was confirmed by comparison of ramjet performance data obtained during high speed sled tests to that available from previous ground freejet and flight tests with this engine. Propulsion performance data over the Mach range 2.3 to 2.5 at zero degree angle of attack were obtained from the sled tests. (Author)

AD-769 070/4GA PC$3.00/MF$1.45
Energy Research Corp Bethel Conn
SILICON CARBIDE RADIAL TURBINE INVESTIGATION.
Final rept. Dec 71-Jun 73,
R. E. Engdahl, E. S. Tillman, Jr., J. E. Motherway, and B. S. Baker. Sep 73, 43p Rept no. ERC-0189F
Contract DAAK02-72-C-0166

Descriptors: (*Turbine wheels, *Silicon carbides), Deposition, Gas turbines, Ceramic materials, Manufacturing methods, Stresses, Thermal analysis, Design.
Identifiers: Chemical vapor deposition.

The report describes the experimental and theoretical efforts to fabricate a small radial ceramic turbine wheel by the chemical vapor deposition (CVD) of silicon carbide (SiC). The CVD process and the fabrication of SiC wheels in tungsten mold is described. A lower cost process for producing graphite molds is also presented. Although certain aspects of the SiC wheel fabrication were shown to be feasible, a complete intact structure was not successfully made. Design aspects of the ceramic wheel including stress and thermal analysis are presented along with suggested mounting procedures. Recommendations for future work are also made. (Author)

AD-769 899/3GA PC$5.25/MF$1.45
Phillips Petroleum Co Bartlesville Okla Research and Development Dept
REDUCTION OF POLLUTANTS FROM AIRCRAFT TURBINE BY FUEL SELECTION AND PREVAPORIZATION.
Final rept. 14 Sep 72-14 Jun 73,
H. T. Quigg. Oct 73, 183p Rept no. 6607-73
Contract N00140-72-C-6969

Descriptors: (*Gas turbines, *Exhaust gases), (*Aviation fuels, Exhaust gases), (*Air pollution, Gas turbines), Hydrocarbons, Aromatic compounds, Alkanes, Humidity, Smokes, Flames, Vaporization, Operation, Carbon monoxide.
Identifiers: Volatility, Radiance, JP-5 fuel.

An investigation was conducted, using the Phillips 2-Inch combustor operating under conditions simulating those in modern aircraft turbine engines, to provide information on the effects of hydrocarbon type and fuel volatility on flame radiance and exhaust emissions. Fuels used in the investigation were a JP-5 for reference and ten pure hydrocarbons (normal, iso-, and cycloparaffins and aromatics) with various boiling points within each hydrocarbon type. Hydrogen content of the fuels ranged from 7.7 to 16.4 weight per cent. The effects of differences in physical properties of the fuels were minimized by prevaporization before introduction to the combustor and maximized by using pressure atomization for injection of fuel to the combustor. Inlet air humidity was included as an operating variable. Empirical equations, based on fuel and operating variables were developed for prediction of flame radiance, NO, NOx, CO, and smoke. (Modified author abstract)

N73-29995/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
PERFORMANCE COMPARISON OF A LOBED-DAISY MIXER NOZZLE WITH A CONVERGENT NOZZLE AT SUBSONIC SPEEDS.
D. L. Maiden. Sep 73, 27p NASA-TM-X-2806, L-8939

Descriptors: *Nozzle design, *Nozzle flow, *Subsonic speed, *Wind tunnel tests, Aerodynamic configurations, Gas flow, Performance tests.

For abstract, see STAR 1121

N73-30737/3GA PC$3.00/MF$1.45
Scientific Translation Service, Santa Barbara, Calif.
INVESTIGATION OF THE HEAT TRANSFER BETWEEN THE GAS AND CASING IN THE AREA OF THE INTER-VANE CHANNELS OF THE STATOR AND GUIDE VANES OF TURBINES.
V. I. Lokay, M. N. Bodunov, V. A. Podgornov, and A. G. Karimova. 3 Sep 73, 12p NASA-TT-F-15051
Contract NASW-2483
Trans-Transl. Into English from Izv. Vyssh. Ucheb. Zaved., Aviats. Tekh. (Kazan), V. 15, No. 3, 1972 p 62-67.

Descriptors: *Cascade flow, *Guide vanes, *Stator blades, *Turbulent heat transfer, Flat plates, Static pressure, Turbine engines.

For abstract, see STAR 1121

N73-30745/6GA PC$8.50/MF$1.45
General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
HIGH TIP SPEED FAN INLET NOISE REDUCTION USING TREATED INLET SPLITTERS AND ACCELERATING INLETS (QUIET ENGINE PROGRAM FAN C SCALE MODEL).
S. B. Kazin. Aug 73, 129p NASA-CR-121268, R72AEG336
Contract NAS3-12430

Descriptors: *Intake systems, *Noise reduction, *Turbofans, Cowlings, Inlet flow, Supersonic speeds.

For abstract, see STAR 1121

N73-30749/8GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TRANSIENT ANALYSIS OF ENERGY TRANSFER CONTROL (ECT) AND COMPRESSOR BLEED CONCEPTS OF REMOTE LIFT FAN CONTROL.
J. F. Sellers. Sep 73, 54p NASA-TM-X-2863, E-7437

Descriptors: *Compressor rotors, *Energy transfer, *Lift fans, *Remote control, Altitude control, Digital computers, Engine control, J-97 engine, Turbofan engines, Vertical takeoff aircraft.

For abstract, see STAR 1121

N73-30751/4GA PC$3.25/MF$1.45
Motoren- und Turbinen-Union Muenchen G.m.b.H. (West Germany).
PRACTICAL APPLICATION OF BOUNDARY LAYER THEORY TO FLOW AND HEAT TRANSFER PROBLEMS IN TURBOMACHINES.
D. K. Hennecke. 1972, 24p
Conf-Presented at 1ST Intern. Symp. On Air Breathing Engines, Marseille, 19-23 Jun. 1972.

Descriptors: *Boundary value problems, *Heat transfer, *Rotor blades (Turbomachinery), Fluid flow, Pressure gradients, Shock waves.

For abstract, see STAR 1121

N73-30752/2GA PC$3.75/MF$1.45
Rolls-Royce, Ltd., Derby (England).
DEVELOPMENT OF THE OLYMPUS TURBOJET TO MEET SUPERSONIC CIVIL TRANSPORT REQUIREMENTS.
A. B. Street. 1971, 33p
Conf-Presented at the 1ST Intern. Symp. On Air Breathing Engines, Marseille, 19-23 Jun. 1972.

Descriptors: *Engine design, *Supersonic transports, *Turbojet engines, Air pollution, Aircraft engines, Combustion chambers, Noise reduction, Reliability engineering.

For abstract, see STAR 1121

N73-30753/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
STEADY STATE ANALYSIS OF ENERGY TRANSFER CONTROL (ETC) AND COMPRESSOR BLEED CONCEPTS OF REMOTE LIFT FAN CONTROL.
J. F. Sellers. Sep 73, 38p NASA-TM-X-2876, E-7436

Descriptors: *Compressors, *Energy transfer, *Fluid mechanics, *Lift fans, *Vertical takeoff aircraft, J-97 engine, Turbofan engines, Turbojet engine control.

For abstract, see STAR 1121

N73-30876/9GA PC$3.50/MF$1.45
Aeronautical Research Labs., Melbourne (Australia).
TWO PHASE EVAPORATIVE COOLING OF AN AEROFOIL.
B. Parmington. Oct 72, 28p ARL/ME-338

Descriptors: *Airfoils, *Cooling systems, *Temperature distribution, *Temperature measurement, Gas flow, Gas turbines, High temperature gases, Turbine blades.

For abstract, see STAR 1121

N73-31623/4GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AN IMPROVED METHOD FOR DESIGN OF EXPANSION-CHAMBER MUFFLERS WITH APPLICATION TO AN OPERATIONAL HELICOPTER.
T. L. Parrott. Oct 73, 73p NASA-TN-D-7309, L-8888

Descriptors: *Engine noise, *Exhaust systems, *Helicopter engines, *Mufflers, *Noise reduction, Acoustic properties, Aircraft equipment, Systems analysis.

For abstract, see STAR 1122

N73-31625/9GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
INVESTIGATION OF THE EFFECT OF INLET TURBULENCE LENGTH SCALE ON FAN DISCRETE TONE NOISE.
B. K. Hodder. Sep 73, 13p NASA-TM-X-62300
Subm-Prepared in Cooperation with Army Air Mobility R and D Lab., Moffett Field, Calif.

Descriptors: *Intake systems, *Lift fans, *Noise reduction, *Wind tunnel tests, Acoustic measurements, Hot-wire flowmeters, Inlet pressure, Mixing length flow theory, Turbulence effects.

For abstract, see STAR 1122

N73-31695/2GA PC$3.50/MF$1.45
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris (France).

HIGH PRESSURE STAGE OUTPUT OF MODERN TURBOREACTOR TURBINES RENDEMENT DE L'ETAGE HAUTE PRESSION DES TURBINES DE TURBOREACTEURS MODERNES.
P. Martinat. 1972, 27p
Conf-Presented at 1ST Intern. Symp. On Air Breathing Engines, 17-23 Jun. 1972.
Language in French.

Descriptors: *High pressure, *Power efficiency, *Turbines, Performance, Turbomachinery.

For abstract, see STAR 1122

N73-31696/0GA PC$3.50/MF$1.45
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris (France).
DEVELOPMENT OF HIGH PERFORMANCE ANNULAR COMBUSTION CHAMBERS BY SNECMA LE DEVELOPPEMENT DES CHAMBRES DE COMBUSTION ANNULAIRES A HAUTES PERFORMANCES A LA SNECMA.
J. Caruel. 1972, 27p
Conf-Presented at 1ST Intern. Symp. On Air Breathing Engines, 17-23 Jun. 1972.
Language in French.

Descriptors: *Combustion chambers, *Performance, *Turbomachinery, Air breathing engines, Pressure effects, Temperature effects.

For abstract, see STAR 1122

N73-31698/6GA PC$3.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
EXPERIMENTAL STUDY OF ROTATING STALL IN HIGH-PRESSURE STAGES OF AN AXIAL FLOW COMPRESSOR.
V. S. Beknev, A. V. Zemlyanskiy, and R. Z. Tumashev. Sep 73, 10p NASA-TT-F-15115
Contract NASW-2485
Tran-Transl. Into English from Mashinostr. (Moscow), No. 8, 1970 p 116-122.

Descriptors: *Aerodynamic stalling, *Axial flow, *Cascade flow, *Flow characteristics, *Turbocompressors, Boundary layer separation, Flow equations, Three dimensional flow.

For abstract, see STAR 1122

N73-31700/0GA PC$3.00/MF$1.45
Techtran Corp., Glen Burnie, Md.
INFLUENCE OF TRANSIENT CONDITIONS ON OVERALL SERVICE LIFE OF TURBINE BLADES.
G. N. Tretyachenko. Sep 73, 8p NASA-TT-F-15113
Contract NASW-2485
Tran-Transl. Into English from Probl. Proch. (Ussr), V. 5, No. 3, Mar. 1973 p 3-6.

Descriptors: *Failure analysis, *Gas turbines, *Rotor blades (Turbomachinery), *Service life, Performance tests, Prediction analysis techniques, Reliability analysis.

For abstract, see STAR 1122

PAT-APPL-394898/GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
DUAL CYCLE AIRCRAFT TURBINE ENGINE.
Patent Application.
M. R. Nichols. Filed 6 Sep 73, 16p NASA-CASE-LAR-11310-1,
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Jet aircraft noise, *Noise reduction, *Propulsive efficiency, *Turbine engines, Air intakes, Patent applications, Turbofan engines.

A method and apparatus applicable to jet engines is presented for improving operating efficiency over broad ranges of flight conditions and for reducing engine noise output in take-off and landing by controlling the airflow entering and exiting the engines. A turbojet engine apparatus is described which operates efficiently at both subsonic and supersonic speeds and a method is described which enables a turbofan with an associated satellite turbojet or turbofan to operate more efficiently at both subsonic and supersonic speeds. In both cases, take-off and landing noise is reduced substantially. The apparatus consists essentially of arranging for two separate portions of an engine to act upon one airstream or, alternately, to operate on independent airstreams.

PATENT-3 490 230/GA Not available NTIS
Department of the Navy Washington D C
COMBUSTION AIR CONTROL SHUTTER.
Patent,
Paul W. Pillsbury, and Jeffrey K. Suter. Filed 22 Mar 68, patented 20 Jan 70, 3p Rept nos. PAT-APPL-715 255,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: (*Injectors, *Patents), (*Turbojet engines, *Combustion chambers), Jet engine inlets, Ducts, Air pollution, Fuel sprays, Combustion.
Identifiers: PAT-CL-60-39-65.

The patent relates to a device whereby a turbojet combustor is provided with scoop ducts mounted on a rotary shutter to control injection of additional air to the burner dome. At low altitude, when smoke is objectionable, the pilot causes rotation of the shutter. The scoop ducts are tilted to produce a swirling air pattern directed at the fuel spray.

PATENT-3 748 853/GA Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SWIRL CAN PRIMARY COMBUSTOR.
Patent.
R. E. Jones, and R. W. Niedzwiecki. Patented 31 Jul 73, 4p NASA-CASE-LEW-11326-1,
Misc-Filed 27 Oct. 1971 Supersedes N72-15714 (10 - 06, p 0811).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Combustion chambers, *Gas turbine engines, *Swirling, Aircraft engines, Annuli, Arrays, Patents.

A swirl can full annulus combustor, operable over a wide range of exit average temperatures is used in a high performance gas turbine engine for advanced aircraft. A large number of swirl can modules are mounted in an array in each combustor.

21F. Nuclear Propulsion

N-72-28681/GA PC$5.45/MF$1.45
Versar, Inc., Springfield, VA. (Usa).
INSTABILITIES IN URANIUM PLASMA AND THE GAS-CORE NUCLEAR ROCKET ENGINE. FINAL REPORT.
D. A. Tidman. May 72, 79p NASA-CR-127480
Contract NASw-2231

Descriptors: (*Space propulsion reactors, *Reactor stability), (*Gas fueled reactors, Reactor stability), (*Plasma instability, *Sound waves), Fluid mechanics, Nonlinear problems, Plasma waves, Reactor cores, Time dependence, Uranium.

For abstract, see NSA 28 07, number 17486.

N-73-12698/GA PC$5.45/MF$1.45
United Aircraft Corp., East Hartford, Conn. Research Labs.
INVESTIGATION OF GASEOUS NUCLEAR ROCKET TECHNOLOGY. SUMMARY TECHNICAL REPORT.
J. S. Kendall. Sep 72, 113p NASA-CR-129500, L-910905-13
Contract SNPC-70

Descriptors: (*Space propulsion reactors, *Research programs), (*Light bulb reactors, Research programs), (*Nuclear furnace reactor, *Testing), Fluid mechanics, Heat transfer, Plasma, Simulation.

For abstract, see NSA 28 07, number 17487.

N-73-12701/GA PC$4.00/MF$1.45
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
ANALYSIS OF A BORON-CARBIDE-DRUM-CONTROLLED CRITICAL REACTOR EXPERIMENT.
W. Mayo. Nov 72, 27p NASA-TM-X-2680

Descriptors: (*Space power reactors, *Reactor kinetics), Control rod worths, Cross sections, Design, Electric power, Fast reactors, Multiplication factors, Power density, Reactivity, Zero power reactors.

For abstract, see NSA 28 07, number 17488.

N-73-16691/GA PC$4.00/MF$1.45
Humphreys Corp., Concord, N. H.
INDUCTION SIMULATION OF GAS CORE NUCLEAR ENGINE.
J. W. Poole, and C. E. Vogel. Feb 73, 44p NASA-CR-2155
Contract NAS3-14416

Descriptors: (*Space propulsion reactors, *Mockup), (*Fluid fueled reactors, Mockup), Performance testing, Reactor cores, Simulation.

For abstract, see NSA 28 07, number 17489.

ORNL-TM-913/GA PC$6.50/MF$1.45
Oak Ridge National Lab., Tenn.
AN EVALUATION OF THE CHEMICAL PROBLEMS ASSOCIATED WITH THE AQUEOUS SYSTEMS IN THE TUNGSTEN WATER MODERATED REACTOR.
J. C. Griess, G. H. Jenks, D. M. Eissenberg, and E. G. Bohlmann. Aug 64, 88p
Contract W-7405-eng-26

Descriptors: (*Space propulsion reactors, *Fluid poison control), (*Water moderator, *Corrosion), (*Aluminium alloys, Corrosion), Beryllium, Boric acid, Cadmium sulfates, Fast neutrons, Gadolinium sulfates, Physical radiation effects, Radiolysis, Samarium sulfates, Solubility, Tensile properties, Zircaloy, Zircaloy-2.

For abstract, see NSA 28 07, number 17492.

ORNL-TM-978/GA PC$6.25/MF$1.45
Oak Ridge National Lab., Tenn.
AN EVALUATION OF THE CHEMICAL PROBLEMS ASSOCIATED WITH THE AQUEOUS SYSTEMS IN THE TUNGSTEN WATER MODERATED REACTOR, ADDENDA 1 AND 2.
G. H. Jenks, E. G. Bohlmann, and J. C. Griess. Mar 65, 85p NASA-CR-54214

Descriptors: (*Space propulsion reactors, *Fluid poison control), (*Water moderator, *Radiolysis), (*Aluminium alloys, *Corrosion), Boric acid, Cadmium sulfates, Gadolinium sulfates, Samarium sulfates.

For abstract, see NSA 28 07, number 17493.

21H. Rocket Motors and Engines

AD-768 967/2GA PC$3.50/MF$1.45
Aerospace Corp El Segundo Calif Engineering Science Operations
BASE FLOW ANALYSIS OF MULTIPLE-ENGINE BOOSTERS.
Research rept. Aug 71-Dec 72,
Yong S. Hong. 16 Jul 73, 65p Rept no. TR-0074(4901-01)-1 SAMSO-TR-73-321
Contract F04701-73-C-0074

Descriptors: (*Exhaust gases, Flow fields), (*Launch vehicles(Aerospace), *Booster motors), Convection(Heat transfer), Boundary layer transition, Heat flux, Pressure, Temperature, Flow separation, Numerical analysis.
Identifiers: Titan 3, Titan 3B launch vehicles.

A method of predicting the base pressure and the base gas temperature of a multi-engine booster has been developed based on Korst's integral theory. The outer base region where the freestream-exhaust jets interaction takes place is analyzed by treating the outer boundary of the multi-jet exhaust plumes as an equivalent single-engine configuration so that the existing single-engine analysis method can be applied readily. Mass and energy transfer from the inner base region is calculated from the exhaust jet interaction analysis which includes the initial boundary layer. Solution is obtained from the net exchange of mass and energy between the outer and the inner base regions. The predicted results have been compared with flight data from the two-engine configuration Titan 3 B booster as well as with some available wind tunnel data on the four-engine configuration. (Author)

JPRS-60208/GA PC$2.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
THE BASIC PROBLEMS OF LIQUID-FUELED ROCKET ENGINES,
V. P. Glushko. 5 Oct 73, 12p
Trans. of Aviatsiya i Kosmonavtika (USSR) n6 p32-33, 42-43 1973.

Descriptors: (*Liquid propellant rocket engines, Evaluation), Liquid rocket propellants, Gas generators, Turbine pumps, Combustion chambers, Specific impulse, USSR, Translations.

The report contains a discussion of the scientific and technical problems involved in developing liquid-fueled rocket engines. (Author)

N73-30755/5GA PC$4.25/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Lampoldshausen (West Germany). Inst. fuer Chemische Raketenantriebe.
CALCULATION OF WALL AND COOLANT TEMPERATURES OF REGENERATIVELY COOLED ROCKET ENGINES.
J. Reinkenhof. 13 Apr 72, 45p DLR-FB-72-29
In German; English Summary.

Descriptors: *Liquid propellant rocket engines, *Regenerative cooling, *Wall temperature, Differential equations, Engine coolants, Heat transfer, Liquid hydrogen, Liquid oxygen, Nozzle geometry, Nozzle walls, Temperature distribution.

For abstract, see STAR 1121

N73-30761/3GA PC$4.25/MF$1.45
Arizona Univ., Tucson.
COMMUNICATIONS OF THE LUNAR AND PLANETARY LABORATORY, VOLUME 9, PART 3.
G. P. Kuiper, and M. Wilson. 1972, 44p NASA-CR-133826, LC-62-63619
Contract NGL-03-002-002

Descriptors: *Astronomical observatories, *Stars, *Venus atmosphere, Astronomical telescopes, Cloud cover, Nasa programs, Sulfuric acid.

For abstract, see STAR 1121

N73-31697/8GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LIQUID ROCKET ENGINE FLUID-COOLED COMBUSTION CHAMBERS.
Space vehicle design criteria (chemical propulsion).
Apr 72, 120p NASA-SP-8087

Descriptors: *Combustion chambers, *Liquid propellant rocket engines, *Rocket engine design, Cooling systems, Equipment specifications, Regenerative cooling, Systems analysis.

For abstract, see STAR 1122

N73-31701/8GA PC$5.50/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
PERFORMANCE CHARACTERIZATION TESTS OF THREE 0.44-N (0.1 LBF) HYDRAZINE CATALYTIC THRUSTERS.
P. I. Moynihan, and R. A. Bjorklund. 1 Sep 73, 68p NASA-CR-135489, JPL-TR-32-1584
Contract NAS7-100

Descriptors: *Hydrazine engines, *Performance tests, *Rocket engine design, *Thrust vector control, Attitude control, Reliability analysis, Service life, Spacecraft control.

For abstract, see STAR 1122

21I. Rocket Propellants

AD-768 604/1GA PC$4.75/MF$1.45
Utah Univ Salt Lake City Dept of Civil Engineering
MEMORY FUNCTION NORMS FOR SOLID ROCKER PROPELLANTS: PART 1. EXPERIMENTAL DEFINITION.
Interim rept.,
Ahmad Usuluddin Sulijoadikusumo, and J. Edmund Fitzgerald. Jul 73, 51p Rept no. UTEC-CE-73-130 AFOSR-TR-73-1923
Grant AF-AFOSR-2322-72

Descriptors: (*Solid rocket propellants, Strain(Mechanics)), Polymers, Deformation, Tensile properties, Viscoelasticity, Stresses, Loading(Mechanics), Damage assessment, Solid rocket propellant binders, Guided missiles(Surface-to-surface).
Identifiers: Minuteman, Materials with memory.

Previously reported investigations by Fitzgerald, Farris, Hufferd and Vakili have employed Lebesgue Norms to characterize internal damage in solid propellants. The essence of the above investigations is that any previous strain history causes the material to change its properties. The present report is based upon the results of carrying out a series of one-directional and two-directional tests on an inert Minuteman Stage 1 propellant with the objective of generalizing and defining the essential character of permanent memory effects. The Chebychev Norm, essential supremum, appears to play the primary role in determining damage. A never decreasing nonlinear viscoelastic range is observed and defined as well as the existence of a Schapery type a sub epsilon shift factor. Two directional experiments indicate the existence of a scalar valued isotropic damage behavior. Part 1, this report, is confined to experimental observations. (Author)

AD-769 045/6GA PC$20.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE STRENGTH OF VISCOELASTIC MATERIALS AS APPLIED TO CHARGES OF SOLID-PROPELLANT ROCKET ENGINES,
V. V. Moskvitin. 11 Oct 73, 361p Rept no. FTD-MT-24-714-73
Edited machine trans. of mono. Soprotivlenie Vyazko-Uprugikh Materialov Primenitelno k Zaryadam Raketnykh, n.p., 1972 p1-328, by John A. Miller.

Descriptors: (*Solid rocket propellants, Mechanical Properties), (*Plastics, Solid rocket propellants), Elasticity, Stresses, Viscoelasticity, Pressure, Compressive properties, Thermal stresses, Loading(Mechanics), Thermal properties, USSR.
Identifiers: Translations, Books.

Contents:
- Selected information from the mechanics of rigid bodies;
- Viscoelastic media;
- Strength conditions long-term strength;
- Polymerization stresses;
- The action of internal pressure;
- Thermal stresses and strains;
- Dynamic loads;
- Stresses and strains with overloads and under conditions of long-term storage;
- Vibrational heat buildup and the simulation of thermal loads;
- Requirements imposed on viscoelastic materials used in load-bearing structures.

N73-30731/6GA PC$4.75/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Lampoldshausen (West Germany). Inst. fuer Chemische Raketenantriebe.
FLUORINE/AMMONIA: POSSIBILITY OF USE IN A TRANSFER STAGE AND PRELIMINARY EXPERIMENTAL EXPERIENCES FLUOR/AMMONIAK: EINSATZMOEGLICHKEIT FUER EINE TRANSFERSTUFE UND ERSTE EXPERIMENTELLE ERFAHRUNGEN.
W. Mueller. Mar 73, 54p BMFT-FB-W-73-07
Subm-Sponsored by Bundesmin. Fuer Forsch. Und Technol.
In German; English Summary.

Descriptors: *Ammonia, *Europa 2 launch vehicle, *Fluorine, *High energy propellants, *Propulsive efficiency, European space programs, Liquid rocket propellants, Performance prediction, Prelaunch tests, Propellant properties, Propulsion system performance, Specific impulse.

For abstract, see STAR 1121

N73-31209/2GA PC$11.25/MF$1.45
AiResearch Mfg. Co., Torrance, Calif.
DESIGN AND DEVELOPMENT OF LIQUID HYDROGEN MIXER UNIT.
Final Report.
R. W. Morgan, K. Wuertz, and R. R. Rudich. 1973, 182p NASA-CR-120963
Contract NAS3-11208

Descriptors: *Cryogenic equipment, *Cryogenic fluids, *Mixers, Helium, Hydrogen, Liquid phases, Vapor phases.

For abstract, see STAR 1122

N73-31687/9GA PC$3.25/MF$1.45
Gorakhpur Univ. (India). Dept. of Chemistry.
COMBUSTION OF POLYSTYRENE AND OXYGEN-STYRENE COPOLYMER/AMMONIUM PERCHLORATE PROPELLANTS.
R. P. Rastogi, K. Kishore, and G. Singh. 13 Jul 73, 25p
Subm-Backup Document for Aiaa Synoptic Scheduled for Publication in Aiaa Journal, January 1974.

Descriptors: *Ammonium perchlorates, *Burning rate, *Combustion physics, *Polystyrene,

*Propellant properties, Flammability, Solid rocket propellants, Thermodynamic properties.

For abstract, see STAR 1122

N73-31688/7GA PC$18.75/MF$1.45
Rocketdyne, Canoga Park, Calif.
REGENERATIVELY COOLED ROCKET ENGINE FOR SPACE STORABLE PROPELLANTS.
Interim Report, May 1970 - Dec. 1971.
W. R. Wagner, and B. J. Waldman. Mar 73, 335p NASA-CR-133915, R-8866
Contract NAS7-765
Subm-Prepared for JPL.

Descriptors: *Engine tests, *Regenerative cooling, *Rocket engine design, *Storable propellants, Boron hydrides, Combustion stability, Heat transfer, Oxygen fluorides, Propulsion system performance, Thrust chambers.

For abstract, see STAR 1122

N73-31762/0GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
TEST STAND FOR PRECISE MEASUREMENT OF IMPULSE AND THRUST VECTOR OF SMALL ATTITUDE CONTROL JETS.
J. R. Woodruff, and D. M. Chisel. Aug 73, 40p NASA-TN-D-7402, A-4846

Descriptors: *Attitude control, *Impulses, *Test stands, *Thrust measurement, Aerospace environments, Hydrazines, Jet thrust.

For abstract, see STAR 1122

N73-31841/2GA PC$12.50/MF$1.45
Aerojet Liquid Rocket Co., Sacramento, Calif.
HYDROGEN FILM COOLING INVESTIGATION.
D. C. Rousar, and R. L. Ewen. Aug 73, 207p NASA-CR-121235
Contract NAS3-15844

Descriptors: *Film cooling, *Flow characteristics, *Hydrogen, *Supersonic flow, Heat transfer, Liquid rocket propellants, Nitrogen, Thin walls.

For abstract, see STAR 1122

22. SPACE TECHNOLOGY

22A. Astronautics

N73-30800/9GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
MISSION PLANNING FOR PIONEER SATURN/URANUS ATMOSPHERIC PROBE MISSIONS.
B. L. Swenson, E. L. Tindle, and L. A. Manning. Sep 73, 20p NASA-TM-X-2824, A-4934

Descriptors: *Atmospheric composition, *Mission planning, *Pioneer space probes, *Saturn (Planet), *Uranus (Planet), Aircraft specifications, Centaur launch vehicle, Flyby missions, Saturn rings, Titan launch vehicles.

For abstract, see STAR 1121

N73-30835/5GA PC$19.50/MF$1.45
Draper (Charles Stark) Lab., Inc., Cambridge, Mass.
INTEGRATED DIGITAL FLIGHT CONTROL SYSTEM FOR THE SPACE SHUTTLE ORBITER.
Jul 73, 346p NASA-CR-134001, E-2736-REV-1
Contracts NAS9-11764, DSR PROJ. 55-47300
Misc-Revised.

Descriptors: *Computer programs, *Flight control, *Space shuttle orbiters, Algorithms, Atmospheric entry, Digital techniques, Horizontal flight.

For abstract, see STAR 1121

N73-30838/9GA PC$4.25/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SLOSH TESTING OF A SPHERICAL MERCURY PROPELLANT TANK WITH POSITIVE-EXPULSION DIAPHRAGM.
R. G. Ross, Jr., and J. R. Womack. 15 Jul 73, 45p NASA-CR-133790, JPL-TM-33-632
Contract NAS7-100

Descriptors: *Liquid sloshing, *Mercury (Metal), *Propellant tanks, *Spherical tanks, Diaphragms, Electric propulsion, Expulsion, Least squares method, Nyquist diagram, Sine waves, Ullage.

For abstract, see STAR 1121

N73-30843/9GA PC$6.25/MF$1.45
GCA Corp., Bedford, Mass. Technology Div.
DEFINITION RESEARCH STUDY.
Final Report.
F. F. Marmo, and J. Pressman. Apr 73, 82p NASA-CR-133836, GCA-TR-73-4-N
Contract NASW-2395

Descriptors: *Cosmic plasma, *Particles, *Space shuttles, *Spacecraft contamination, Cosmic dust, Experimental design, Space debris.

For abstract, see STAR 1121

N73-31007/0GA PC$16.50/MF$1.45
LTV Aerospace Corp., Dallas, Tex. Vought Systems Div.
STUDY OF SPACE SHUTTLE EVA/IVA SUPPORT REQUIREMENTS. VOLUME 2: EVA/IVA TASKS, GUIDELINES, AND CONSTRAINTS DEFINITION.
B. W. Webbon, R. J. Copeland, P. W. Wood, Jr., and R. L. Cox. 30 Apr 73, 289p NASA-CR-133992, T-192-RP05-VOL-2
Contract NAS9-12507

Descriptors: *Extravehicular activity, *Intravehicular activity, *Portable life support systems, *Space shuttles, *Spacecraft environments, Human factors engineering, Mission planning, Protective clothing, Space missions.

For abstract, see STAR 1122

N73-31009/6GA PC$9.50/MF$1.45
LTV Aerospace Corp., Dallas, Tex. Vought Systems Div.
STUDY OF SPACE SHUTTLE EVA/IVA SUPPORT REQUIREMENTS. VOLUME 4: REQUIREMENTS STUDY FOR SPACE SHUTTLE MOBILITY AIDS.
P. W. Wood, Jr.. 30 Apr 73, 147p NASA-CR-133994, T-192-RP05-VOL-4
Contract NAS9-12507

Descriptors: *Constraints, *Human factors engineering, *Life support systems, *Space shuttles, Astronaut locomotion, Equipment specifications, Systems analysis.

For abstract, see STAR 1122

N73-31010/4GA PC$12.00/MF$1.45
LTV Aerospace Corp., Dallas, Tex. Vought Systems Div.
STUDY OF SPACE SHUTTLE EVA/IVA SUPPORT REQUIREMENTS. VOLUME 5: REQUIREMENTS STUDY FOR SPACE SHUTTLE EMERGENCY 4 SUPPORT.
R. J. Copeland, and R. L. Cox. 30 Apr 73, 200p NASA-CR-133995, T-192-RP05-VOL-5
Contract NAS9-12507

Descriptors: *Emergencies, *Intravehicular activity, *Life support systems, *Space shuttles, Human factors engineering, Protective clothing, Safety devices.

For abstract, see STAR 1122

N73-31013/8GA PC$4.50/MF$1.45
Energy Research Corp., Bethel, Conn.
CARBON DIOXIDE ADSORBENT STUDY.
Final Report.
M. Onischak, and B. S. Baker. Sep 73, 47p NASA-CR-114661
Contract NAS2-7023

Descriptors: *Carbon dioxide removal, *Carbonates, *Extravehicular activity, *Life support systems, Alkali metals, Feasibility analysis, Gas-metal interactions.

For abstract, see STAR 1122

N73-31019/5GA PC$13.00/MF$1.45
Martin Marietta Corp., Denver, Colo.
DESIGN, FABRICATION AND ACCEPTANCE TESTING OF A ZERO GRAVITY WHOLE BODY SHOWER, VOLUME I.
Final Report.
Jul 73, 216p NASA-CR-134066, MCR-73-172-VOL-1
Contract NAS1-11339

Descriptors: *Bathing, *Space stations, *Weightlessness, Hygiene, Manned space flight, Performance tests, Systems engineering, Washing.

For abstract, see STAR 1122

N73-31020/3GA PC$3.75/MF$1.45
Essex Corp., Alexandria, Va.
THE ROLE OF MAN IN FLIGHT EXPERIMENT PAYLOAD MISSIONS. VOLUME 1: RESULTS.
T. B. Malone. Aug 73, 34p NASA-CR-135487
Contract NASW-2389
Seri-2.

Descriptors: *Personnel development, *Spacecrews, *Spacelab, Abilities, Classifications, Experimental design, Human factors engineering, Mission planning, Payloads.

For abstract, see STAR 1122

N73-31021/1GA PC$6.25/MF$1.45
Essex Corp., Alexandria, Va.
THE ROLE OF MAN IN FLIGHT EXPERIMENT PAYLOAD MISSIONS. VOLUME 2: APPENDICES.
T. B. Malone. Aug 73, 84p NASA-CR-135488
Contract NASW-2389
Seri-2.

Descriptors: *Personnel development, *Spacecrews, *Spacelab, Classifications, Experimental design, Human factors engineering, Human performance, Mission planning, Payloads.

For abstract, see STAR 1122

N73-31207/6GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
CVT/PCS PHASE 1 INTEGRATED TESTING.
R. O. Mcbrayer, and J. D. Steadman. Jul 73, 41p NASA-TM-X-64770

Descriptors: *Payloads, *Space missions, *Spacecraft cabin simulators, *Spacelab, *Tests, Acoustic measurements, Breadboard models, Cloud physics, Crystal growth, Ionospheric disturbances, Space shuttles, Space simulators.

For abstract, see STAR 1122

N73-31726/5GA PC$3.50/MF$1.45
North American Rockwell Corp., Downey, Calif. Space Div.
SAFETY IN EARTH ORBIT STUDY.
Final Report (contract summary).
12 Jul 72, 26p NASA-CR-134023, SD-72-SA-0095
Contract NAS9-12004

Descriptors: *Aircraft safety, *Payloads, *Space shuttle orbiters, *Space stations, Earth orbits, Escape systems, Hazards, Safety devices, Spacecraft docking.

For abstract, see STAR 1122

N73-31728/1GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A PRELIMINARY ANALYSIS OF A RADAR-MAPPING MISSION TO VENUS.
J. S. Mackay, L. E. Edsinger, L. C. Evans, L. A. Manning, and K. F. Sinclair. Sep 73, 69p NASA-TM-X-2868, A-4834

Descriptors: *Radar imagery, *Radar maps, *Venus probes, Centaur launch vehicle, Space shuttle orbiters.

For abstract, see STAR 1122

N73-31729/9GA PC$8.75/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
STUDY OF AIRBORNE SCIENCE EXPERIMENT MANAGEMENT CONCEPTS FOR APPLICATION TO SPACE SHUTTLE, VOLUME 2.
D. R. Mulholland, J. O. Reller, Jr., C. B. Neel, and L. C. Haughney. Jul 73, 132p NASA-TM-X-62287

Descriptors: *Airborne equipment, *Mission planning, *Research management, Aerodynamic characteristics, Aircraft safety, Management planning, Research facilities, Technology transfer.

For abstract, see STAR 1122

N73-31730/7GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala. Aero-Astrodynamics Lab.
OPTIMUM INCLINATION FOR SHUTTLE RETRIEVAL OF INCLINATION NON-SENSITIVE SATELLITES.
D. L. Blackwell. Aug 73, 18p NASA-TM-X-64780

Descriptors: *Inclination, *Retrieval, *Satellite orbits, Space shuttles, Spacecraft recovery.

For abstract, see STAR 1122

N73-31735/6GA PC$4.00/MF$1.45
Martin Marietta Corp., Denver, Colo.
A STUDY OF AN ORBITAL RADAR MAPPING MISSION TO VENUS. VOLUME 1: SUMMARY.
Final Report.
Sep 73, 38p NASA-CR-114640
Contract NAS2-7204
Seri-3.

Descriptors: *Orbital mechanics, *Radar maps, *Venus (Planet), *Venus probes, *Venus radar echoes, Cost effectiveness, Mission planning, Space missions, Spacecraft performance.

For abstract, see STAR 1122

N73-31736/4GA PC$16.25/MF$1.45
Martin Marietta Corp., Denver, Colo.
A STUDY OF AN ORBITAL RADAR MAPPING MISSION TO VENUS. VOLUME 2: CONFIGURATION COMPARISONS AND SYSTEMS EVALUATION.
Final Report.
Sep 73, 283p NASA-CR-114641
Contract NAS2-7204
Seri-3.

Descriptors: *Radar maps, *Venus (Planet), *Venus probes, *Venus radar echoes, Cost effectiveness, Mission planning, Space missions, Spacecraft performance.

For abstract, see STAR 1122

N73-31737/2GA PC$27.00/MF$1.45
Martin Marietta Corp., Denver, Colo.
A STUDY OF AN ORBITAL RADAR MAPPING MISSION TO VENUS. VOLUME 3: PARAMETRIC STUDIES AND SUBSYSTEM COMPARISONS.
Final Report.
Sep 73, 498p NASA-CR-114642
Contract NAS2-7204
Seri-3.

Descriptors: *Orbital mechanics, *Radar maps, *Venus (Planet), *Venus probes, *Venus radar echoes, Cost effectiveness, Mission planning, Payloads, Space missions, Spacecraft performance.

For abstract, see STAR 1122

N73-31741/4GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
DOCKING TECHNOLOGY.
Sep 73, 14p NASA-TT-F-15105
Contract NASW-2481
Tran-Transl. Into English from Nauka Zhizn (Ussr), No. 4, 1973 p 7-13.

Descriptors: *Aerospace engineering, *Spacecraft docking, *Technologies, Orbital mechanics, Orbital rendezvous.

For abstract, see STAR 1122

N73-31745/5GA PC$3.00/MF$1.45
Kanner (Leo) Associates, Redwood City, Calif.
THE STRATEGY OF SPACE RESEARCH.
H. Alfven. Sep 73, 11p NASA-TT-F-15120
Contract NASW-2481
Tran-Transl. Into English from Strategiya Kosmich. Issled. (Ussr), No. 7, Jul. 1972 p 11-14.

Descriptors: *Aerospace sciences, *Energy transfer, Energy sources, Plasma physics, Rocket engines, Solar system.

For abstract, see STAR 1122

N73-31751/3GA PC$19.50/MF$1.45
TRW Systems, Redondo Beach, Calif.
MISSION REQUIREMENTS FOR A MANNED EARTH OBSERVATORY. VOLUME 1, TASK 1: EXPERIMENT SELECTION, DEFINITION, AND DOCUMENTATION.
31 May 73, 347p NASA-CR-124368, TRW-21324-6001-RU-00
Contract NAS8-28013

Descriptors: *Experimental design, *Mission planning, *Space shuttles, Agriculture, Geology, Hydrology, Meteorology, Oceanography.

For abstract, see STAR 1122

N73-31752/1GA PC$20.75/MF$1.45
General Dynamics/Convair, San Diego, Calif. Aerospace Div.
SPACE PROCESSES FOR EXTENDED LOW-G TESTING.
Final Report.
W. H. Steurer, S. Kaye, and D. J. Gorham. 15 Jun 73, 374p NASA-CR-124385, CASD-STT-73-005
Contract NAS8-28615

Descriptors: *Aerospace engineering, *Reduced gravity, *Stability tests, Airborne equipment, Equipment specifications, Low cost, Payloads.

For abstract, see STAR 1122

N73-31772/9GA PC$3.50/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APOLLO EXPERIENCE REPORT: SYSTEMS AND FLIGHT PROCEDURES DEVELOPMENT.
P. C. Kramer. Sep 73, 55p NASA-TN-D-7436, JSC-S-366

Descriptors: *Apollo project, *Astronaut performance, *Mission planning, *Space missions, *Spacecraft performance, Human factors engineering, Procedures, Trajectory analysis.

For abstract, see STAR 1122

N73-31773/7GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APOLLO EXPERIENCE REPORT: POSTFLIGHT TESTING OF COMMAND MODULES.
D. T. Hamilton. Sep 73, 18p NASA-TN-D-7435, JSC-S-365

Descriptors: *Apollo spacecraft, *Failure analysis, *Postflight analysis, *Space missions, Malfunctions, Reliability engineering, Spacecraft components, Systems analysis.

For abstract, see STAR 1122

N73-31777/8GA PC$3.00/MF$1.45
Techtran Corp., Silver Spring, Md.
THE BIRTH OF SAFETY.
M. Chernyshov. Sep 73, 9p NASA-TT-F-15077
Contract NASW-2485
Tran-Transl. Into English from Aviat. Kosmonavt. (Moscow), No. 7, Jul. 1973 p 36-37.

Descriptors: *Reliability engineering, *Safety factors, *Space programs, Accident prevention, Performance tests, Quality control, Space flight.

For abstract, see STAR 1122

N73-31781/0GA PC$4.25/MF$1.45
General Dynamics/Convair, San Diego, Calif. Aerospace Div.
AEROELASTIC EFFECTS ON SPACE SHUTTLE DYNAMICS.
Final Report.
29 Jun 73, 42p NASA-CR-124370, CASD-SST-73-001
Contract NAS8-26363

Descriptors: *Aeroelasticity, *Dynamic loads, *Space shuttles, *Spacecraft configurations, *Static loads, *Stress analysis, Aerodynamic stability, Automatic pilots, Gust loads, Turbulence effects.

For abstract, see STAR 1122

N73-31783/6GA PC$7.75/MF$1.45
Pennsylvania State Univ., University Park. Dept. of Aerospace Engineering.
OPTIMAL DETUMBLING OF A LARGE MANNED SPACECRAFT USING AN INTERNAL MOVING MASS.
B. G. Kunciw. Jun 73, 115p NASA-CR-135515, PSU-ARR-73-8
Contract NGR-39-009-210
Subm-Sponsored in Part by NSF.

Descriptors: *Manned spacecraft, *Spacecraft stability, *Tumbling motion, Angular velocity, Computer programs, Equations of motion, Mass distribution, Moments of inertia, Time series analysis.

For abstract, see STAR 1122

N73-31798/4GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

EXTENDED TORSIONAL TESTS OF AN INTERLOCKED BI-STEM SATELLITE BOOM.
R. A. Abercrombie. Aug 73, 26p NASA-TN-D-7365, G-7319

Descriptors: *Booms (Equipment), *Spacecraft structures, *Torsion, Deflection, Hysteresis, Oscillations, Torque.

For abstract, see STAR 1122

N73-31840/4GA PC$10.25/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
APOLLO 17 HEAT FLOW AND CONVECTION EXPERIMENTS: FINAL DATA ANALYSES RESULTS.
T. C. Bannister, P. G. Grodzka, L. W. Spradley, S. V. Bourgeois, and R. O. Hedden. 16 Jul 73, 164p NASA-TM-X-64772
Contract NAS8-25577
Subm-Prepared in Cooperation with Lockheed Missiles and Space CO., Huntsville, Ala.

Descriptors: *Apollo 17 flight, *Heat transmission, Fluid flow, Translunar injection, Weightlessness.

For abstract, see STAR 1122

N73-31842/0GA PC$12.25/MF$1.45
LTV Aerospace Corp., Dallas, Tex. Vought Systems Div.
THE ENVIRONMENTAL HEAT FLUX ROUTINE, VERSION 4 (EHFR-4) AND MULTIPLE REFLECTIONS ROUTINE (MRR), VOLUME 1.
Final Report.
J. B. Dietz. 24 Aug 73, 204p NASA-CR-134031, T155-01-VOL-1
Contract NAS9-7644

Descriptors: *Computer programs, *Spacecraft environments, *Thermal environments, Deep space, Lunar topography, Printouts, Punched cards, Run time (Computers), Vacuum chambers.

For abstract, see STAR 1122

N73-31858/6GA PC$13.75/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
JPL QUARTERLY TECHNICAL REVIEW, VOLUME 3, NO. 2, JULY 1973.
Jul 73, 231p NASA-CR-133863
Contract NAS7-100

Descriptors: *Interplanetary spacecraft, *Satellite attitude control, *Solid rocket propellants, *Spacecraft electronic equipment, *Systems engineering, Feasibility analysis, Propulsion system configurations, Radiation shielding, Spacecraft performance, Test facilities.

For abstract, see STAR 1122

22B. Spacecraft

AD-768 616/5GA MF$1.45
Mcdonnell Douglas Astronautics Co Huntington Beach Calif
PLUME CONTAMINATION EFFECTS PREDICTION. THE CONTAM COMPUTER PROGRAM, VERSION II.
Final rept. Aug 70-Apr 73,
R. J. Hoffman, W. T. Webber, S. S. Cherry, F. Cramer, and W. D. English. Aug 73, 765p AFRPL-TR-73-46
Contract FO4611-72-C-0037
See also AD-735 722.
Availability: Available in microfiche only.

Descriptors: (*Exhaust gases, Erosion), (*Spacecraft components, Erosion), Combustion chambers, Surfaces, Degradation, Coatings, Optical properties, Computer programs, Instruction manuals.

Identifiers: *Rocket exhaust, Impingement, CONTAM computer program.

The effect of rocket exhaust plume impingement on sensitive vehicle surfaces is an area of continuing concern in the design of spacecraft, missiles and reentry vehicle systems. The objective of this study was to develop a single computer code capable of predicting the production, transport, and deposition of engine and plume contaminants, and the change in absorptivity, emissivity, reflectivity, and transmissivity of a functional spacecraft surface, such as thermal control coatings and optical view ports and lenses, resulting from plume contaminant deposition or mechanical abrasion (sand blasting). Both bipropellants and monopropellants have been treated. Surface chemical reaction with a deposited plume contaminant layer was not treated. Analytical models and computer subprograms have been developed and integrated to form the CONTAM computer program. Complete user's manuals for each of the computer subprograms as well as the CONTAM program are included in this report, along with details of the analysis and numerical methods. A sample case illustrating the CONTAM program's capability is presented. (Author)

AD-769 049/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ONE OPERATING PRINCIPLE OF A MANNED ORBITAL ATRONOMICAL OBSERVATORY,
G. A. Gurzadyan. 16 Oct 73, 9p Rept no. FTD-HT-23-195-74
Edited trans. of Byurakanskaya Observatoriya. Soobshcheniya (USSR) n65 p5-11 1972, by John A. Miller.

Descriptors: (*Manned spacecraft, *Star trackers), (*Scientific satellites, *Astronomical observatories), Tracking telescopes, Astronauts, Astronomical cameras, Orbital trajectories, USSR.
Identifiers: Translations.

The development of manned spaceships and orbital stations has presented new possibilities for carrying out astrophysical observations under extra-atmospheric conditions. Primarily, such stations can contain larger telescopes and other astronomical equipment. Secondarily, the presence of a cosmonaut aboard the orbital station, even one who is not a professional astronomer, makes it possible to provide a broader and more complex observation program than when the observatory is completely automatically controlled by systems having a specific preset program, one not subject to change.

JPRS-60179/GA PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
CONTROL IN SPACE.
B. V. Raushenbakh, I. Benesh, and V. A. Bodner. 2 Oct 73, 41p
Trans. of Upravlenie v Kosmose (USSR) v1 p144-151; v2 p139-148, 277-288 1972.

Descriptors: (*Artificial satellites, *Attitude control), Spacecraft control, Communication satellites, Gyrostabilizers, Navigation computers, Nuclear energy, Control theory, USSR, Translations, Markov processes.

Contents:
- Orientation system for the Molniya-1 communications satellite;
- Automated monitoring of the reliability of onboard computers and simulation of a problem using Markov processes nonuniform in time;
- Synthesis of optimal control systems for nuclear power plants and power supplies aboard spacecraft.

JPRS-60199-1/GA PC$5.25/MF$1.45
Joint Publications Research Service, Arlington, Va.
OPTO-ELECTRONIC INSTRUMENTS FOR SPACECRAFT. PART I,
A. N. Iznar, A. V. Pavlov, and B. F. Federov. 4 Oct 73, 176p
Trans. of mono. Optiko-Elektronnye Pribory Kosmicheskikh Apparatov, Moscow, 1972 268p. See also JPRS-60199-2.

Descriptors: (*Spacecraft instruments, Quantum electronics), Spacecraft guidance, Star trackers, Lasers, Semiconductor devices, Photodiodes, Instrument characteristics, Translations, USSR.

The report contains a discussion of the theoretical principles of planning and designing opto-electronic orientation and navigation instruments, and a study of the construction principles and the standard schematics for opto-electronic instruments for different purposes. Methods of calculating the parameters are presented which take into account the radiation attenuation in the atmosphere and the background effect and also the peculiarities of calculating the basic parameters of equipment with lasers. Methods of calculating the radiation characteristics of the sources are given.

JPRS-60199-2/GA PC$5.50/MF$1.45
Joint Publications Research Service, Arlington, Va.
OPTO-ELECTRONIC INSTRUMENTS FOR SPACECRAFT. PART II,
A. N. Iznar, A. V. Pavlov, and B. F. Federov. 4 Oct 73, 213p
Trans. of mono. Optiko-Elektronnye Pribory Kosmicheskikh Apparatov, Moscow, 1972 368p. See also JPRS-60199-1.

Descriptors: (*Spacecraft instruments, Quantum electronics), Spacecraft guidance, Star trackers, Lasers, Semiconductor devices, Attitude control, Radiation measuring instruments, Instrument characteristics, Tranlations, USSR.

The report is the second part of a discussion of the theoretical principles of planning and designing opto-electronic orientation and navigation instruments, and a study of the construction principles and the standard schematics for opto-electronic instruments for different purposes. Methods of calculating the parameters are presented which take into account the radiation attenuation in the atmosphere and the background effect and also the peculiarities of calculating the basic parameters of equipment with lasers. Methods of calculating the radiation characteristics of the sources are given .

N73-30697/9GA PC$3.75/MF$1.45
Boeing Aerospace Co., Seattle, Wash.
ACTIVE CLEANING TECHNIQUES FOR REMOVING CONTAMINATION FROM OPTICAL SURFACES IN SPACE.
Quarterly Progress Report.
R. L. Shannon, and R. B. Gillette. 1973, 34p NASA-CR-124374, QPR-8
Contract NAS8-26385

Descriptors: *Chemical cleaning, *Contaminants, *Mirrors, Argon, Hydrogen, Oxygen, Plasmas (Physics), Ultraviolet radiation, Wavelengths.

For abstract, see STAR 1121

N73-30830/6GA PC$3.75/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PRESSURE SIGNATURES FOR A .00853 SCALE MODEL OF THE SATURN 5-APOLLO LAUNCH VEHICLE WITH SIMULATED EXHAUST PLUMES.
R. M. Hicks, and J. P. Mendoza. Jul 73, 31p NASA-TM-X-62129

Descriptors: *Exhaust gases, *Saturn 5 launch vehicles, *Scale models, *Wind tunnel tests, Overpressure, Shock waves, Simulation, Sonic booms.

For abstract, see STAR 1121

N73-30836/3GA PC$6.25/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
VIKING ORBITER 1975 ARTICULATION CONTROL SUBSYSTEM DESIGN ANALYSIS.
H. H. Horiuchi, and L. J. Vallas. 15 Jul 73, 83p NASA-CR-135649, JPL-TM-33-599
Contract NAS7-100

Descriptors: *Control equipment, *Satellite control, *Satellite guidance, *Viking orbiter 1975, Digital systems, Electronic equipment, Servocontrol, Systems engineering.

For abstract, see STAR 1121

N73-30837/1GA PC$5.25/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Guidance and Control Div.
ANALYSIS AND SIMULATION OF THE MARINER MARS 1971 SCAN PLATFORM: SPACECRAFT DYNAMIC INTERACTION.
L. Schumacher. 15 Aug 73, 62p NASA-CR-133793, JPL-TM-33-624
Contract NAS7-100

Descriptors: *Computerized simulation, *Mariner spacecraft, *Spacecraft structures, Attitude control, Spacecraft control, Telemetry.

For abstract, see STAR 1121

N73-30841/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
POSTFLIGHT SIMULATION OF PARACHUTE DEPLOYMENT DYNAMICS OF VIKING QUALIFICATION FLIGHT TESTS.
C. H. Whitlock, L. R. Poole, and T. A. Talay. Sep 73, 38p NASA-TN-D-7415, L-9145

Descriptors: *Aerodynamic characteristics, *Parachute descent, *Recovery parachutes, *Viking 75 entry vehicle, Equipment specifications, Performance tests, Systems analysis.

For abstract, see STAR 1121

N73-30842/1GA PC$6.25/MF$1.45
Boeing Co., Huntsville, Ala. Launch Systems Branch.
STATISTICAL DETERMINATION OF SPACE SHUTTLE COMPONENT DYNAMIC MAGNIFICATION FACTORS.
F. Lehner. 31 May 73, 81p NASA-CR-124337, D5-17250
Contract NAS8-28650

Descriptors: *Component reliability, *Dynamic characteristics, *Vibratory loads, Acoustics, Brackets, Magnification, Nomographs, Spacecraft components.

For abstract, see STAR 1121

N73-30844/7GA PC$4.00/MF$1.45
Lockheed Missiles and Space Co., Sunnyvale, Calif.
ALTERNATE CONCEPTS STUDY EXTENSION. VOLUME I: EXECUTIVE SUMMARY.
Final Report.
15 Nov 71, 37p NASA-CR-124345, ACS-201
Contract NAS8-26362

Descriptors: *Avionics, *Space shuttles, *Spacecraft configurations, *Spacecraft design, *Thermal protection, Equipment specifications, Project management, Systems analysis.

For abstract, see STAR 1121

N73-30845/4GA PC$5.50/MF$1.45
Applied Dynamics Research Corp., Huntsville, Ala.
SPACE SHUTTLE DAMPER SYSTEM FOR GROUND WIND LOAD TESTS.
Final Report, 17 Apr. 1972 - 16 Apr. 1973.
G. D. Robinson, J. R. Holt, and C. S. Chang. 16 Apr 73, 68p NASA-CR-124367, T1045F
Contract NAS8-28613

Descriptors: *Aerodynamic loads, *Damping, *Dynamic response, *Space shuttles, *Wind effects, Aeroelasticity, Spacecraft configurations, Spacecraft stability.

For abstract, see STAR 1121

N73-30846/2GA PC$5.25/MF$1.45
Fairchild Industries, Inc., Germantown, Md.
STANDARDIZATION AND ECONOMICS OF NUCLEAR SPACECRAFT: EXECUTIVE SUMMARY.
Final Report on Phase 1, SENSE Study.
5 Jan 73, 61p NASA-CR-133743, SNSO-3063-1
Contract AT(49-15)-3063
Subm-Sponsored in Part by NASA.

Descriptors: *Cost reduction, *Nuclear propulsion, *Spacecraft design, Economy, Standardization, Unmanned spacecraft.

For abstract, see STAR 1121

N73-30848/8GA PC$4.75/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany). Inst. fuer Aeroelastik.
AN ANALYTICAL APPROACH TO THE SOLUTION OF NONLINEAR AEROELASTIC GALLOPING INSTABILITY.
H. Foersching, and V. Manea. 1973, 54p DLR-FB-73-18, AVA-FB-7224
Subm-Sponsored in Part by Alexander von Humboldt-Stift.
In German; English Summary.

Descriptors: *Aerodynamic stability, *Aeroelasticity, *Beams (Supports), *Space shuttles, Aerodynamic configurations, Ground wind, Polygons, Problem solving.

For abstract, see STAR 1121

N73-30880/1GA PC$16.00/MF$1.45
Martin Marietta Corp., Denver, Colo.
ABLATIVE HEAT SHIELD DESIGN FOR SPACE SHUTTLE.
Final Report, May 1972 - Aug. 1973.
R. W. Seiferth. Aug 73, 279p NASA-CR-132282, MCR-73-147
Contract NAS1-11592

Descriptors: *Ablative materials, *Heat shielding, *Space shuttle orbiters, Ceramic coatings, Cost analysis, Environmental tests, Systems engineering.

For abstract, see STAR 1121

N73-30883/5GA PC$9.75/MF$1.45
Union Carbide Corp., Tonawanda, N.Y.
REUSEABLE LIGHTWEIGHT MODULAR MULTI-LAYER INSULATION FOR SPACE SHUTTLE.
Final Report.
K. F. Burr. Jul 73, 152p NASA-CR-121166
Contract NAS3-14366

Descriptors: *Cryogenic fluid storage, *Liquid hydrogen, *Multilayer insulation, *Space shuttle orbiters, Composite materials, Equipment specifications, Materials tests, Product development.

For abstract, see STAR 1121

N73-31412/2GA PC$3.25/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
QUARTZ CRYSTAL MICROBALANCE CONTAMINATION MONITORS ON SKYLAB: A QUICK LOOK ANALYSIS.
R. Naumann, W. Moore, D. Nisen, W. Russell, and P. Tashbar. 8 Jun 73, 21p NASA-TM-X-64778

Descriptors: *Contamination, *Quartz crystals, *Skylab program, Command modules, Outgassing, Rendezvous, Service modules.

For abstract, see STAR 1122

N73-31448/6GA PC$4.25/MF$1.45
Bendix Corp., Ann Arbor, Mich. Aerospace Systems Div.
PIONEER VENUS MECHANICAL ROOTS PUMP TEST AND EVALUATION.
Final Report.
N. C. Thomas, and W. E. Crosmer. Sep 73, 44p NASA-CR-114660, BSR-4090
Contract NAS2-7384

Descriptors: *Mass spectrometers, *Performance tests, *Pumps, Pioneer space probes, Venus probes.

For abstract, see STAR 1122

N73-31761/2GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APOLLO EXPERIENCE REPORT: COMMAND AND SERVICE MODULE INSTRUMENTATION SUBSYSTEM.
F. A. Rotramel. Aug 73, 25p NASA-TN-D-7374, JSC-S-351

Descriptors: *Apollo spacecraft, *Command modules, *Instruments, *Service modules, Equipment specifications, Product development, Systems engineering.

For abstract, see STAR 1122

N73-31763/8GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APOLLO EXPERIENCE REPORT: SERVICE PROPULSION SUBSYSTEM.
C. R. Gibson, and J. A. Wood. Aug 73, 25p NASA-TN-D-7375, JSC-S-378

Descriptors: *Apollo spacecraft, *Propulsion system configurations, *Service modules, *Spacecraft propulsion, Propulsion system performance, Reliability analysis, Systems engineering.

For abstract, see STAR 1122

N73-31765/3GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE FIRST EARTH RESOURCES TECHNOLOGY SATELLITE (ERTS-1).
W. Nordberg. Aug 73, 19p NASA-TM-X-70462, X-650-73-241
Subm-Submitted for Publication. Conf-Presented at 14TH Meeting of Cospar, Konstanz, West Germany, 25 May 1973.

Descriptors: *Data acquisition, *Earth resources technology satellites, Data collection platforms, Electromagnetic spectra, Return beam vidicons.

For abstract, see STAR 1122

N73-31766/1GA PC$6.00/MF$1.45
Martin Marietta Corp., Denver, Colo.
A FEASIBILITY STUDY OF DEVELOPING TOROIDAL TANKS FOR A SPINNING SPACECRAFT.
Final Report.

J. E. Anderson, and D. A. Fester. Sep 73, 78p NASA-CR-114666, MCR-73-223
Contract NAS2-7489

Descriptors: *Propellant tanks, *Propulsion system configurations, *Toroidal shells, Attitude control, Propellant storage, Spacecraft design.

For abstract, see STAR 1122

N73-31767/9GA PC$3.00/MF$1.45
Radio Corp. of America, Princeton, N.J.
ENGINEERING DESIGN, STRESS AND THERMAL ANALYSIS, AND DOCUMENTATION FOR SATS PROGRAM.
24 Jul 73, 15p NASA-CR-132800
Contract NAS5-21750

Descriptors: *Applications technology satellites, *Solar arrays, *Space storage, Deployment, Spacecraft structures, Spin reduction, Torque, Yo-yo devices.

For abstract, see STAR 1122

N73-31768/7GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APOLLO EXPERIENCE REPORT: COMMAND MODULE CREW-COUCH/RESTRAINT AND LOAD-ATTENUATION SYSTEMS.
R. E. Drexel, and H. N. Hunter. Sep 73, 19p NASA-TN-D-7440, JSC-S-379

Descriptors: *Apollo spacecraft, *Command modules, *Couches, Astronauts, Attenuators, Human factors engineering, Spacecraft design.

For abstract, see STAR 1122

N73-31769/5GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APOLLO EXPERIENCE REPORT: RELIABILITY AND QUALITY ASSURANCE.
K. P. Sperber. Sep 73, 38p NASA-TN-D-7438, JSC-S-371

Descriptors: *Apollo spacecraft, *Quality control, *Reliability engineering, Failure analysis, Management planning, Spacecraft components, Spacecraft design.

For abstract, see STAR 1122

N73-31770/3GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APOLLO EXPERIENCE REPORT: SPACECRAFT STRUCTURAL WINDOWS.
O. E. Pigg, and S. P. Weiss. Sep 73, 25p NASA-TN-D-7439, JSC-S-377

Descriptors: *Apollo spacecraft, *Command modules, *Glass, *Lunar module, *Windows (Apertures), Fracture mechanics, Optical properties, Structural analysis.

For abstract, see STAR 1122

N73-31771/1GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APOLLO EXPERIENCE REPORT: CREW STATION INTEGRATION. VOLUME 4: STOWAGE AND THE SUPPORT TEAM CONCEPT.
M. W. Hix. Sep 73, 30p NASA-TN-D-7434, JSC-S-364-VOL-4

Descriptors: *Apollo spacecraft, *Onboard equipment, *Space storage, *Spacecraft configurations, Equipment specifications, Spacecraft components, Systems analysis.

For abstract, see STAR 1122

N73-31774/5GA PC$12.75/MF$1.45
Boeing Co., Seattle, Wash. Research and Engineering Div.
EVALUATION OF A METAL SHEAR WEB SELECTIVELY REINFORCED WITH FILAMENTARY COMPOSITES FOR SPACE SHUTTLE APPLICATION. PHASE 1 SUMMARY REPORT: SHEAR WEB DESIGN DEVELOPMENT.
J. H. Laakso, and D. K. Zimmerman. 1972, 213p NASA-CR-132320, D180-15104
Contract NAS1-10860
Seri-3.

Descriptors: *Composite materials, *Space shuttle orbiters, *Webs (Supports), Boron compounds, Epoxy compounds, Reinforced plates, Structural analysis, Structural weight, Titanium.

For abstract, see STAR 1122

N73-31775/2GA PC$6.25/MF$1.45
Boeing Co., Seattle, Wash. Research and Engineering Div.
EVALUATION OF A METAL SHEAR WEB SELECTIVELY REINFORCED WITH FILAMENTARY COMPOSITES FOR SPACE SHUTTLE APPLICATION. PHASE 2: SUMMARY REPORT: SHEAR WEB COMPONENT FABRICATION.
J. H. Laakso, D. D. Smith, and D. K. Zimmerman. Feb 73, 82p NASA-CR-132321, D180-15323
Contract NAS1-10860
Seri-3.

Descriptors: *Composite materials, *Space shuttle orbiters, *Webs (Supports), Boron compounds, Epoxy compounds, Reinforced plates, Structural analysis, Structural weight, Titanium.

For abstract, see STAR 1122

N73-31776/0GA PC$14.50/MF$1.45
Boeing Co., Seattle, Wash. Research and Engineering Div.
EVALUATION OF A METAL SHEAR WEB SELECTIVELY REINFORCED WITH FILAMENTARY COMPOSITES FOR SPACE SHUTTLE APPLICATION. PHASE 3 SUMMARY REPORT: SHEAR WEB COMPONENT TESTING AND ANALYSIS.
J. H. Laakso, and J. W. Straayer. Aug 73, 247p NASA-CR-132322, D180-17566-1
Contract NAS1-10860
Seri-3.

Descriptors: *Component reliability, *Composite materials, *Space shuttle orbiters, *Webs (Supports), Boron compounds, Epoxy compounds, Reinforced plates, Structural analysis, Structural weight, Titanium.

For abstract, see STAR 1122

N73-31778/6GA PC$7.50/MF$1.45
North American Rockwell Corp., Downey, Calif. Space Div.
A STUDY OF SPACE SHUTTLE STRUCTURAL INTEGRITY TEST AND ASSESSMENT. PART 1.
Final Report.
R. E. Anderson, and R. G. Poe. Jan 72, 109p NASA-CR-133859, SD-72-SH-0001-PT-1
Contract NAS10-7679

Descriptors: *Space shuttles, *Structural stability, *Ultrasonic tests, Aircraft noise, Nondestructive tests, Ultrasonic wave transducers.

For abstract, see STAR 1122

N73-31779/4GA PC$4.75/MF$1.45
North American Rockwell Corp., Downey, Calif. Space Div.
A STUDY OF SPACE SHUTTLE STRUCTURAL INTEGRITY TEST AND ASSESSMENT. PART 2: APPENDICES.
Final Report.
R. E. Anderson, and R. G. Poe. Jan 72, 55p NASA-CR-133815, SD-72-SH-0001-PT-2-APP
Contract NAS10-7679

Descriptors: *Space shuttles, *Structural stability, *Ultrasonic tests, Aircraft noise, Nondestructive tests, Ultrasonic wave transducers.

For abstract, see STAR 1122

N73-31782/8GA PC$4.25/MF$1.45
General Dynamics/Convair, San Diego, Calif. Aerospace Div.
DESIGN AND DEVELOPMENT OF PRESSURE AND REPRESSURIZATION PURGE SYSTEM FOR REUSABLE SPACE SHUTTLE MULTILAYER INSULATION SYSTEM.
Progress Report.
19 Jul 73, 43p NASA-CR-124380, REPT-632-3-286
Contract NAS8-27419

Descriptors: *Fuel tank pressurization, *Multilayer insulation, *Reusable spacecraft, *Space shuttles, Cryogenic fluid storage, Production engineering, Purging, Systems engineering.

For abstract, see STAR 1122

N73-31786/9GA PC$5.50/MF$1.45
Max-Planck-Institut fuer Aeronomie, Lindau Uber Northeim (West Germany). Inst. fuer Stratosphaerenphysik.
REPORT ON THE EXTENDED MISSION OF THE INJUN 5 SATELLITE BERICHT UEBER DIE VERLAENGERTE MISSION DES SATELLITEN INJUN 5.
J. W. Muench, G. R. Pilkington, E. Kirsch, and B. Hente. Aug 72, 69p BMBW-FB-W-72-24
Contract WRK-225
Subm-Prepared Jointly with Tech. Univ., Brunswick.
In German; English Summary.

Descriptors: *Data processing, *Explorer 40 satellite, *Satellite observation, Alpha particles, Electric fields, Electron precipitation, Ground based control, Magnetosphere, Polar regions, Protons, Very low frequencies.

For abstract, see STAR 1122

PAT-APPL-389916/GA PC$3.25/MF$1.45
Martin Marietta Corp., Baltimore, Md.
VARIABLE RATIO MIXED-MODE BILATERAL MASTER-SLAVE CONTROL SYSTEM FOR SHUTTLE REMOTE MANIPULATOR SYSTEM.
Patent Application.
S. B. Brodie, C. R. Flatau, and F. J. Greeb. Filed 20 Aug 73, 24p NASA-CASE-MSC-14245-1, Contract NAS9-11932
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Control equipment, *Manipulators, *Space shuttles, *Spacecraft components, Man machine systems, Patent applications, Systems analysis.

A variable ratio, mixed-mode, bilateral master-slave control system for the space shuttle remote manipulator system is described. The construction of the device and the method of operation are explained. Applications for other than the space shuttle mission are suggested.

PATENT-3 749 156/GA Not available NTIS
Fairchild Hiller Corp., Germantown, Md.
THERMAL CONTROL SYSTEM FOR A SPACECRAFT MODULAR HOUSING.
Patent.
R. J. Eby, and E. I. Powers. Patented 31 Jul 73, 7p NASA-CASE-GSC-11018-1,
Misc-Filed 17 Apr. 1972 Supersedes N72-25871 (10 - 16, p 2216). Subm-Sponsored by NASA.

Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Heat transfer, *Spacecraft modules, *Temperature control, *Thermal insulation, Equipment specifications, Patents, Product development.

The development of a thermal control system for a spacecraft module is discussed. The wall structures are composed of superinsulation in some cases and of thermally conductive material in other cases. Heat pipes are installed to provide a path of heat transfer from the interior of the module to space. The design of the system makes it possible to maintain a relatively uniform temperature throughout the module with side variations of the amount of heat dissapated by the components within the module.

PATENT-3 752 993/GA Not available NTIS
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SPACECRAFT ATTITUDE SENSOR.
Patent.
A. C. Davidson, and M. M. Grant. Patented 14 Aug 73, 15p NASA-CASE-GSC-10890-1,
Misc-Filed 2 Feb. 1971 Supersedes N71-34589 (09 - 21, p 3455).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Attitude (Inclination), *Optical scanners, *Spacecraft position indicators, Angular velocity, Coordinates, Panoramic scanning, Patents, Systems engineering.

A system for sensing the attitude of a spacecraft includes a pair of optical scanners having a relatively narrow field of view rotating about the spacecraft x-y plane. The spacecraft rotates about its z axis at a relatively high angular velocity while one scanner rotates at low velocity, whereby a panoramic sweep of the entire celestial sphere is derived from the scanner. In the alternative, the scanner rotates at a relatively high angular velocity about the x-y plane while the spacecraft rotates at an extremely low rate or at zero angular velocity relative to its z axis to provide a rotating horizon scan. The positions of the scanners about the x-y plane are read out to assist in a determination of attitude. While the satellite is spinning at a relatively high angular velocity, the angular positions of the bodies detected by the scanners are determined relative to the sun by providing a sun detector having a field of view different from the scanners.

SC-DR-720532/GA PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N. Mex.
TRIM-ANGLE PREDICTIONS FOR A SLIGHTLY BLUNTED CONICAL REENTRY VEHICLE WITH A FLARE-SECTION ASYMMETRY.
E. L. Jr. Clark. Jun 73, 20p

Descriptors: (*Space vehicles, *Reentry), Configuration, Mach number.

For abstract, see NSA 28 08, number 20640.

22C. Spacecraft Trajectories and Reentry

AD-768 377/4GA PC$9.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
DETERMINATION OF REENTRY CORRIDOR WIDTH BASED ON HEATING.
Master's thesis,
John J. Kessler, and Paul D. Tofte. Jun 73, 145p Rept no. GGC/EE/73-8

Descriptors: (*Lifting reentry vehicles, *Atmosphere entry), Aerodynamic heating, Descent trajectories, Lift, Drag, Angle of attack, Manned spacecraft, Dynamic programming, Theses.
Identifiers: Reentry windows.

The report contains a two-dimensional study of the reentry corridor for lifting body reentry vehicles with available maximum lift-to-drag ratios of 1, 1.5, 2 and 3. The initial velocity range investigated is from 7.9 km/sec to 23.7 km/sec which encompasses reentry missions from near earth to interplanetary return. Two studies of the reentry corridor are presented: a constant control study where a specific constanc control, angle of attack, was applied from reentry to capture; an optimal control method, differential dynamic programming, was used to determine if the corridor width could be extended from that determined by the constant control by applying an optimal time varying control from reentry to capture. The results of the two studies show that the constant control window is a good approximation of the optimal control window. The boundaries of the reentry corridor are defined by capture and heating rate constraints. (Modified author abstract)

AD-768 379/0GA PC$5.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
BALLISTIC SKIP GUIDANCE FOR ATMOSPHERIC RE-ENTRY.
Master's thesis,
Melvin L. Nagel. Jun 73, 61p Rept no. GGC/EE/73-10

Descriptors: (*Atmosphere entry, *Terminal guidance), (*Manned spacecraft, Atmosphere entry), Atmosphere models, Mathematical models, Equations of motion, Angle of attack, Lift, Drag, Theses.
Identifiers: Control theory, Reentry guidance, Ballistic skip, Reentry trajectories.

The feasibility of a re-entry guidance scheme that uses ballistic flight to attain a variable surface range is investigated. The equations of motion are derived, and the re-entry trajectory is divided into four phases: pull up, skipout, ballistic, and terminal. The pull up, skipout, and terminal phases are within the atmosphere, while the ballistic phase is outside the atmosphere. The conjugate gradient optimization method is used in the skipout phase to determine the re-entry vehicle control needed to achieve the desired initial ballistic phase conditions. The cost function uses the errors between the actual trajectory and a reference trajectory which is obtained by projecting a ballistic path into the atmosphere. The equations for the reference trajectory are presented. Ballistic theory is discussed and a parametric selection technique is presented as a means of determining the ballistic parameters needed for a specific range. An optimal control solution is found for one set of ballistic initial conditions. (Author)

AD-768 380/8GA PC$6.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
BALLISTIC ENERGY PARAMETER CONTROLLER FOR ATMOSPHERIC REENTRY OF A LIFTING BODY.
Master's thesis,
Dennis Navin. Jun 73, 80p Rept no. GGC/EE-73-11

Descriptors: (*Atmosphere entry, *Terminal guidance), (*Manned spacecraft, *Lifting reentry vehicles), Deceleration, Mathematical models, Equations of motion, Angle of attack, Aerodynamic heating, Kinetic energy, Theses.
Identifiers: Reentry trajectories, Control theory.

A preliminary investigation was conducted on the usefulness of the nondimensional ballistic energy parameter Q in a control scheme for the atmospheric reentry of a lifting body with a maximum L/D of 2. A feasible control scheme was developed that allowed onboard calculation of the angle of attack which was used as the control. The control scheme was used over a wide spread of surface ranges while still meeting criteria on heating rate, deceleration and obtaining a desired final velocity. The final altitude was near that desired. The control scheme is flexible in that it has the capability of updating itself continually as its states become better known and if the control becomes saturated for a part of the reentry trajectory the scheme will pick up again when the vehicle returns to a controllable state. The development was in two dimensional space and comparisons were made with desirable reference trajectories. (Author)

AD-768 381/6GA PC$7.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
A SECOND ORDER METHOD FOR COMPUTING AN OPTIMAL RE-ENTRY TRAJECTORY USING NUMERICAL DERIVATIVES.
Master's thesis,
David Richards. Jun 73, 104p Rept no. GGC/EE/73-16

Descriptors: (*Lifting reentry vehicles, *Atmosphere entry), Descent trajectories, Aerodynamic heating, Drag, Partial differential equations, Matrix algebra, Integration, Programming(Computers), Theses.
Identifiers: Control theory, Numerical integration, Reentry trajectories.

The primary purpose of the study was to investigate a second order method using numerical derivatives to converge to an optimal set of initial costates that would produce an optimal re-entry trajectory. A second objective of the research was to test the computational method by computing a minimum total heat input trajectory (two dimensional) for a lifting body. It was assumed that the vehicle could attain a maximum lift-to-drag of 2.0 during its desent from a near earth orbit. The initial states are known, the initial costates are unknown, and only the final altitude at a fixed final range is specified. The second order method uses the first and second difference equations to iterate on corrections to an arbitrarily chosen set of initial costates. The corrections are based on minimizing a scalar terminal error function. The results indicate that the numerical integration errors limit too severely the accuracy to which the second partials of the terminal errors with respect to the initial costates could be estimated. (Modified author abstract)

N73-30214/3GA PC$6.75/MF$1.45
National Academy of Public Administration, Washington, D.C.
THE ADMINISTRATION OF THE NASA SPACE TRACKING SYSTEM AND THE NASA SPACE TRACKING SYSTEM IN AUSTRALIA.
N. Hollander. 31 Jan 73, 92p NASA-CR-133828
Contract NSR-09-046-001

Descriptors: *Australia, *International cooperation, *Nasa programs, *Tracking networks, Economy, Operations research, Personnel management.

For abstract, see STAR 1121

N73-30224/2GA PC$5.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany). Inst. fuer Angewandte Gasdynamik.
DEVELOPMENT AND TESTS OF A PROTOTYPE AERODYNAMIC FREE FLIGHT MEASUREMENT SYSTEM FOR GUN TUNNELS PROTOTYPENENTWICKLUNG UND -ERPROBUNG EINES AERODYNAMISCHEN

FREIFLUGMESSYSTEMS FUER DEN GUN TUNNEL.
G. Requart, and H. Kabelitz. 5 Jul 72, 58p DLR-FB-72-41
In German; English Summary.

Descriptors: *Free flight test apparatus, *Hypervelocity guns, *Wind tunnel models, Light beams, Magnetic suspension, Reentry vehicles, Space shuttles, Wind tunnel tests.

For abstract, see STAR 1121

N73-30642/5GA PC$3.75/MF$1.45
Draper (Charles Stark) Lab., Inc., Cambridge, Mass.
MISSION SL-3 (AS 207/CM 117/IMU 31) G AND N ERROR ANALYSIS (SKYLAB 3).
S. B. Helfant. Jul 73, 31p NASA-CR-133997, E-2785
Contracts NAS9-4065, DSR PROJ. 55-23890

Descriptors: *Error analysis, *Skylab program, *Space navigation, *Spacecraft guidance, Failure analysis, Gyroscopic stability, Tables (Data).

For abstract, see STAR 1121

N73-30795/1GA PC$6.75/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SPACE SHUTTLE RENDEZOUS, RADIATION AND REENTRY ANALYSIS CODE.
D. M. Mcglathery. 16 May 73, 93p NASA-TM-X-64768

Descriptors: *Extraterrestrial radiation, *Mission planning, *Reentry trajectories, *Rendezvous spacecraft, *Space shuttles, Angles (Geometry), Atmospheric entry, Landing sites.

For abstract, see STAR 1121

N73-30814/0GA PC$4.50/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Abteilung Mathematische Verfahren.
A METHOD FOR COMPUTING COPLANAR TRANSFERS IN A NEWTONIAN CENTRAL FORCE FIELD.
H. Sommer. 1973, 47p DLR-FB-73-29
In German; English Summary.

Descriptors: *Gravitational fields, *Orbit calculation, *Transfer orbits, Circular orbits, Coplanarity, Electric propulsion, Equations of motion, Field theory (Physics), Rocket thrust, Tangents.

For abstract, see STAR 1121

N73-30815/7GA PC$7.75/MF$1.45
Technische Hochschule, Munich (West Germany). Inst. fuer Raumfahrttechnik.
INVESTIGATIONS OF THE MANEUVERABILITY OF REENTRY BODIES UNTERSUCHUNGEN ZUR MANOEVRIERFAEHIGKEIT VON WIEDEREINTRITTSKOERPERN.
A. Suess. May 72, 114p BMBW-FB-W-72-15
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
In German; English Summary.

Descriptors: *Maneuverability, *Maneuverable reentry bodies, *Reentry trajectories, *Trajectory analysis, Landing sites, Lifting reentry vehicles, Orbital mechanics, Parking orbits, Reentry effects, Reentry physics, Return to earth space flight, Trajectory control.

For abstract, see STAR 1121

N73-30816/5GA PC$6.25/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany). Inst. fuer Flugfunk und Mikrowellen.
OBSERVATIONS ON THE GERMAN RESEARCH SATELLITE 625-A1, AZUR, (69971, GRS-A) TO DETERMINE ITS DEVIATION IN TIME BEOBACHTUNGEN AM DEUTSCHEN FORSCHUNGSSATELLITEN 625-A1, AZUR, (69971 GRS-A) ZUR BESTIMMUNG DES ZEITFEHLERS.
W. Splechtna. May 72, 81p BMBW-FB-W-72-18
Subm-Sponsored by Bundesmin. Fuer Bildung und Wiss.
In German; English Summary.

Descriptors: *Azur satellite, *Ground stations, *Orbit perturbation, *Satellite tracking, *Time lag, Ground based control, Orbit calculation, Orbit decay, Orbital elements.

For abstract, see STAR 1121

N73-30831/4GA PC$4.25/MF$1.45
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
EFFECTS OF ASCENT TRAJECTORY MODE AND TANK DISPOSAL METHOD ON SHUTTLE PAYLOAD ACCOMMODATION.
J. C. Blair, W. W. Heuser, and J. R. Redus. 10 Aug 73, 44p NASA-TM-X-64773

Descriptors: *Ascent trajectories, *Jettison systems, *Payloads, *Propellant tanks, *Space shuttles, Flight mechanics, Indian ocean, Jettisoning.

For abstract, see STAR 1121

N73-30839/7GA PC$3.75/MF$1.45
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SUBOPTIMAL STOCHASTIC CONTROLLER FOR AN N-BODY SPACECRAFT.
V. Larson. 15 Aug 73, 35p NASA-CR-133788, JPL-TM-33-640
Contract NAS7-100

Descriptors: *Optimal control, *Spacecraft models, *Stochastic processes, Linear systems, Mathematical models, Spacecraft design.

For abstract, see STAR 1121

N73-31085/6GA PC$4.75/MF$1.45
TRW Systems Group, Redondo Beach, Calif. Electronic Systems Engineering Dept.
ANTENNA AND PROPAGATION STUDIES FOR SPACECRAFT SYSTEMS: ADDENDUM TO PREFLIGHT SL-1/SL-3 SKYLAB VHF RANGING COVERAGE (EARLY AND LATE TPI).
D. R. Eisenhauer, and D. A. James. 25 Jul 73, 55p NASA-CR-133996, TRW-20029-H203-R0-01-ADD
Contract NAS9-12330

Descriptors: *Rendezvous trajectories, *Saturn workshops, *Skylab program, *Very high frequencies, Directional antennas, Rangefinding, Spacecraft tracking.

For abstract, see STAR 1122

N73-31211/8GA PC$3.75/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany). Inst. fuer Flugfunk und Mikrowellen.
PROGRAM CONTROL OF THE GERMAN CENTRAL GROUND STATION (Z-DBS), WEILHEIM-LICHTENAU.
W. Splechtna. 20 Jun 72, 31p DLR-MITT-72-16
Contracts RFF-4017, RFF-4018
In German; English Summary.

Descriptors: *Automatic control, *Ground stations, Antennas, Data processing, Germany, Punched tapes, Sequencing, Switching.

For abstract, see STAR 1122

N73-31723/2GA PC$18.00/MF$1.45
Analytical Mechanics Associates, Inc., Seabrook, Md.
TETHERED BODY PROBLEMS AND RELATIVE MOTION ORBIT DETERMINATION.
Final Report.
J. B. Eades, Jr., and H. Wolf. Aug 72, 316p NASA-CR-132780, REPT-72-35
Contract NAS5-21453

Descriptors: *Orbit calculation, *Spacecraft motion, *Tetherlines, Circular orbits, Gravitational fields, Numerical analysis, Satellite orbits, Transfer functions.

For abstract, see STAR 1122

N73-31727/3GA PC$2.75/MF$1.45
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SUMMARY OF SATURN SWINGBY MISSIONS TO URANUS.
L. A. Manning. Sep 73, 23p NASA-TM-X-2914, A-5001

Descriptors: *Round trip trajectories, *Saturn (Planet), *Swingby technique, *Uranus (Planet), Launch windows, Payload mass ratio, Titan launch vehicles.

For abstract, see STAR 1122

N73-31733/1GA PC$3.25/MF$1.45
Martin Marietta Corp., Denver, Colo.
STUDY OF BALLISTIC MODE MERCURY ORBITER MISSIONS. VOLUME I: SUMMARY REPORT.
G. R. Hollenbeck. Jul 73, 25p NASA-CR-114617
Contract NAS2-7268

Descriptors: *Ballistics, *Flight plans, *Mariner venus-mercury 1973, *Mercury flights, Flight paths, Flyby missions, Solar electric propulsion, Solid propellant rocket engines, Spacecraft performance, Thermal environments.

For abstract, see STAR 1122

N73-31734/9GA PC$11.00/MF$1.45
Martin Marietta Corp., Denver, Colo.
STUDY OF BALLISTIC MODE MERCURY ORBITER MISSIONS. VOLUME 2: TECHNICAL REPORT.
W. S. Cook, G. R. Hollenbeck, P. S. Lewis, D. G. Roos, and D. E. Wainwright. Jul 73, 178p NASA-CR-114618
Contract NAS2-7268

Descriptors: *Ballistics, *Flight plans, *Mariner venus-mercury 1973, *Mercury flights, Flight paths, Flyby missions, Solar electric propulsion, Solid propellant rocket engines, Spacecraft performance, Thermal environments.

For abstract, see STAR 1122

N73-31739/8GA PC$3.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TECHNIQUES FOR THE ANALYSIS OF GEODYNAMIC EFFECTS USING LASER DATA.
P. J. Dunn, D. E. Smith, and R. Kolenkiewicz. May 73, 14p NASA-TM-X-70459, X-592-73-235
Subm-Submitted for Publication.

Descriptors: *Geodetic coordinates, *Laser ranger/tracker, *Satellite orbits, Geopotential, Latitude measurement, Tides.

For abstract, see STAR 1122

N73-31750/5GA PC$6.25/MF$1.45
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

APOLLO 15 MISSION REPORT, SUPPLEMENT 4: DESCENT PROPULSION SYSTEM FINAL FLIGHT EVALUATION.
A. T. Avvenire, and S. C. Wood. Sep 72, 81p
NASA-TM-X-69506, MSC-05161-SUPPL-4
Contract NAS9-12330
Subm-Prepared by TRW Systems Group, Houston.

Descriptors: *Apollo 15 flight, *Descent propulsion systems, *Postflight analysis, Flight characteristics, Pressure regulators, Propulsion system performance.

For abstract, see STAR 1122

N73-31757/0GA PC$7.25/MF$1.45
Technische Hochschule, Munich (West Germany). Inst. fuer Astronomische und Physikalische Geodaesie.
PRELIMINARY ORBIT DETERMINATION OF ARTIFICIAL EARTH SATELLITES ZUR VORLAEUFIGEN BAHNBESTIMMUNG KUENSTLICHER ERDSATELLITEN.
K. H. Ilk. May 72, 105p BMBW-FB-W-72-16
Contracts WRK-132, SFB-78
In German; English Summary.

Descriptors: *Computer programs, *Earth orbits, *Orbit calculation, Inertial reference systems, Integral equations, Nonlinear equations, Satellite perturbation, Tesseral harmonics, Trajectory analysis.

For abstract, see STAR 1122

N73-31759/6GA PC$3.50/MF$1.45
Technischen Universitaet, Munich (West Germany). Sonderforschungsbereich 78 Satellitengeodaesie.
SOLVING INITIAL-VALUE PROBLEMS OF ORBITAL MECHANICS BY MEANS OF BOUNDARY-VALUE PROBLEMS UEBER DIE LOESUNG VON ANFANGSWERTPROBLEMEN DER PUNKTMECHANIK MIT HILFE VON RANDWERTPROBLEMEN.
M. Schneider. Aug 72, 30p BMBW-FB-W-72-23
Contracts WRK-132, WRK-187
Subm-Sponsored in Part by Deut. Forschungsgemeinschaft.
In German; English Summary.

Descriptors: *Boundary value problems, *Orbit calculation, *Orbital mechanics, Applications of mathematics, Celestial geodesy, Eigenvectors, Equations of motion, Integral equations, Iterative solution.

For abstract, see STAR 1122

N73-31787/7GA PC$4.00/MF$1.45
Royal Aircraft Establishment, Farnborough (England).
TABLE OF SPACE VEHICLES LAUNCHED DURING THE YEARS 1958-1972.
H. Hiller, and J. A. Pilkington. Feb 73, 40p 0RAE-TR-73006, 0BR34098

Descriptors: *Spacecraft launching, *Spacecraft orbits, Earth-moon system, Eccentricity, Flight time, Launch dates, Lunar orbits, Mars (Planet), Mass, Planetary orbits, Size (Dimensions), Solar orbits, Tables (Data).

For abstract, see STAR 1122

22D. Spacecraft Launch Vehicles and Ground Support

N73-30833/0GA PC$4.00/MF$1.45
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE DELTA LAUNCH VEHICLE MODEL 2914 SERIES.
C. R. Gunn. Sep 73, 36p 0NASA-TM-X-70455, 0X-470-73-262
Subm-Submitted for Publication.

Descriptors: *Delta launch vehicle, *Flight characteristics, *Injection guidance, *Launch vehicle configurations, Interfaces, Spacecraft environments.

For abstract, see STAR 1121

N73-31409/8GA PC$17.50/MF$1.45
Martin Marietta Corp., Orlando, Fla.
GROUND STATION HARDWARE FOR THE ATS-F MILLIMETER WAVE EXPERIMENT.
Final Report.
T. L. Duffield. Feb 73, 306p 0NASA-CR-132802, 0OR-12395
Contract 0NAS5-215250

Descriptors: *Ats 6, *Experimental design, *Ground stations, *Millimeter waves, Phase locked systems, Radiometers, Receivers, Signal processing, Wave propagation.

For abstract, see STAR 1122

REPORT LOCATOR LIST

This list comprises all the reports cited in this issue. It is arranged alpha-numerically by accession number. The subject field and group where the report citation can be located in the journal precedes the accession number.

All of the reports announced in this issue are indexed by corporate author, subject, personal author, contract number, and accession/report number in the companion index **Volume 73, Number 24.**

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08J AD-768 684/3GA
06A AD-768 685/0GA
06A AD-768 686/8GA
08J AD-768 687/6GA
08A AD-768 688/4GA
13E AD-768 689/2GA
10B AD-768 690/0GA
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13H AD-768 692/6GA

20K AD-768 693/4GA
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21D AD-768 696/7GA
13J AD-768 697/5GA
17G AD-768 698/3GA
06P AD-768 699/1GA
19F AD-768 700/7GA
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18C AD-768 784/1GA

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06H COM-73-11750/9GA
08G COM-73-11751/7GA
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04B COM-73-11753/3GA
06C COM-73-11754/1GA
06C COM-73-11755/8GA
08J COM-73-11756/6GA
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04B COM-73-11760/8GA
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06C COM-73-11762/4GA
06C COM-73-11763/2GA
08G COM-73-11764/0GA
08N COM-73-11765/7GA
03B COM-73-11766/5GA
06C COM-73-11767/3GA
06C COM-73-11768/1GA
08A COM-73-11769/9GA
08A COM-73-11770/7GA
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13B COM-73-11773/1GA
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03B COM-73-11778/0GA
06C COM-73-11779/8GA
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06H COM-73-11781/4GA
05C COM-73-11782/2GA
08I COM-73-11783/0GA
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06C COM-73-11792/1GA
06M COM-73-11793/9GA
06C COM-73-11794/7GA
06H COM-73-11795/4GA
08H COM-73-11796/2GA
09A COM-73-11797/0GA
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08H COM-73-11799/6GA
13B COM-73-11800/2GA
13B COM-73-11801/0GA
13B COM-73-11803/6GA
06C COM-73-11805/1GA
04B COM-73-11806/9GA
08C COM-73-11807/7GA
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06C COM-73-11809/3GA
06C COM-73-11810/1GA
06C COM-73-11811/9GA
02E COM-73-11812/7GA
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06C COM-73-11814/3GA
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04B COM-73-11816/8GA
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04B COM-73-11818/4GA
04B COM-73-11819/2GA
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06P COM-73-11823/4GA
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06C COM-73-11825/9GA
05I COM-73-11826/7GA
06C COM-73-11828/3GA
06C COM-73-11829/1GA
04B COM-73-11830/9GA
06C COM-73-11831/7GA
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06C COM-73-11846/5GA
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08H COM-73-11857/2GA
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05C COM-73-50182-51/GA
05C COM-73-50182-52/GA
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05C COM-73-50835-01/GA
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08C COM-73-50872/3GA
08J COM-73-50873/1GA
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07D COM-73-50876/4GA
07E COM-73-50878/0GA
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05C COM-73-70074/2GA
20L CONF-720349-(Absts.)/GA
06R CONF-720505-/GA
18J CONF-721012-3/GA
06F CONF-721227-1/GA
06F CONF-730505-7/GA
18F CONF-730546-1/GA
06A CONF-730547-1/GA
06R CONF-730550-1/GA
18F CONF-730619-1/GA
06C CONF-730623-2/GA
06P CONF-730633-1/GA
06A CONF-730634-1/GA
06E CONF-730639-1/GA
18B CONF-730641-1/GA
06P CONF-730644-1/GA
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20I CONF-730710-/GA
20L CONF-730715-1/GA
20L CONF-730715-2/GA
18J CONF-730803-2/GA
18J CONF-730807-2/GA
10B CONF-730811-4/GA
12A CONF-730812-2/GA
20L CONF-730813-1/GA
20L CONF-730813-3/GA
11F CONF-730813-4/GA
06R CONF-730814-1/GA
13B CONF-730817-1/GA
06F CONF-730817-2/GA
18I CONF-730819-1/GA
11F CONF-730822-1/GA
18D CONF-730824-1/GA
18I CONF-730904-1/GA
06R CONF-730907-2/GA
18C CONF-730907-6/GA
11F CONF-730916-1/GA
18J CONF-730916-2/GA
18J CONF-730918-1/GA
18G CONF-730919-1/GA
20L CONF-730920-1/GA
18J CONF-731003-2/GA
07C COO-1222-57/GA
20D COO-1248-35/GA
06C COO-1332-60/GA
06C COO-1332-70/GA
06F COO-1332-88/GA
06F COO-1332-90/GA
06C COO-1332-93/GA
06F COO-1332-95/GA
20H COO-1428-318/GA
20H COO-1428-320/GA
20H COO-1428-321/GA
20H COO-1428-323/GA
12A COO-1469-212/GA
12A COO-1469-215/GA
20H COO-1545-125/GA
20H COO-1545-126/GA
20H COO-1545-127/GA
06H COO-1689-8/GA
06H COO-1689-9/GA
20H COO-1717-6/GA
20H COO-1764-179/GA
06R COO-1787-17/GA
06F COO-2003-18/GA
20H COO-2114-7/GA
06F COO-2115-4/GA
06F COO-2164-7/GA
14B COO-2204-2/GA
20H COO-2232-7-Ex/GA
18I COO-2244-1(Rev.1)/GA
20H COO-3001-42/GA
06C COO-3010-10/GA
18I COO-3019-4/GA
18A COO-3028-5/GA
18J COO-3028-6/GA
20H COO-3065-44/GA
20H COO-3071-25/GA
20H COO-3080-2/GA
06R COO-3097-6/GA
07D COO-3126-21/GA
20H COO-3130-TA-286/GA
20H COO-3130-TA-288/GA
20L COO-3151-17/GA
20F COO-3151-22/GA
20L COO-3151-23/GA
20L COO-3158-22/GA
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06A COO-3162-16/GA
07D COO-3212-10/GA
20H COO-3235-24/GA
20H COO-3239-6/GA
06R COO-3267-3/GA
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06F COO-3279-6/GA
07E COO-3286-5/GA
11B COO-3344-10/GA
11B COO-3344-9/GA
06A COO-3400-16/GA
07E COO-3416-10/GA
18J COO-3422-1/GA
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11F COO-3429-9/GA
08D COO-3462-11/GA
06O COO-3492-13/GA
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07D COO-3498-9/GA
20I COO-3632-10/GA
20I COO-3632-11/GA
20I COO-3632-9/GA
11F COO-841-28/GA
20H DESY-73/13/GA
20H DESY-73/14/GA
07D DNPL/R-24/GA
18E DOCKET-STN-50437-1/GA
18E DOCKET-STN-50437-2/GA
18E DOCKET-STN-50437-3/GA
18E DOCKET-STN-50437-4/GA
18E DOCKET-STN-50437-5/GA
18E DOCKET-STN-50437-6/GA
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18H DOCKET-700371-2/GA
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11B DP-MS-72-31/GA
18B DP-MS-72-35/GA
18B DP-MS-72-45/GA
11F DP-MS-72-6/GA
07E DP-MS-72-68/GA
11F DP-MS-73-11/GA
18I DP-MS-73-27/GA
18J DP-1327/GA
18I DP-1329/GA
18J DPSPU-70-124-4/GA
18I DUN-7777-8/GA
20H EANDC(E)-157-U(Vol.1)/GA
06F EDFB-IBP-72-12/GA
06F EDFB-IBP-73-5/GA
06F EDFB-IBP-73-6/GA
13B EIS-AA-73-1734-F/GA
13B EIS-AA-73-1744-F/GA
13B EIS-AZ-73-1707-D/GA
13B EIS-CA-1681-F-3/GA
13B EIS-CA-73-1681-F-1/GA
13B EIS-CA-73-1681-F-2/GA
13B EIS-CA-73-1681-F-4/GA
13B EIS-CA-73-1720-D/GA
13B EIS-CA-73-1726-F/GA
13B EIS-CA-73-1738-F/GA
13B EIS-CA-73-1741-F/GA
13B EIS-CO-73-1689-F/GA
13B EIS-CO-73-1700-D/GA
13B EIS-DE-73-1725-D/GA
13B EIS-FL-73-1698-F/GA
13B EIS-HI-73-1712-D/GA
13B EIS-HI-73-1715-D/GA
13B EIS-HI-73-1721-D/GA
13B EIS-HI-73-1778-D/GA
13B EIS-IA-73-1710-D/GA
13B EIS-IL-73-1690-D/GA
13B EIS-IL-73-1745-F/GA
13B EIS-IN-73-1718-D/GA
13B EIS-IN-73-1735-D/GA
13B EIS-KS-73-1696-F/GA
13B EIS-KS-73-1753-D/GA
13B EIS-KY-73-1724-D/GA
13B EIS-KY-73-1727-D/GA
13B EIS-KY-73-1739-D/GA
13B EIS-LA-73-1704-D-1/GA
13B EIS-LA-73-1704-D-2/GA
13B EIS-MA-73-1705-D/GA
13B EIS-MD-73-1728-D/GA
13B EIS-MI-73-1736-D/GA
13B EIS-MN-73-1752-F/GA
13B EIS-MO-73-1674-D/GA
13B EIS-MS-73-1706-D/GA
13B EIS-MS-73-1716-F/GA
13B EIS-MS-73-1749-F/GA
13B EIS-MT-73-1733-F/GA
13B EIS-NB-73-1732-D/GA
13B EIS-NB-73-1740-D/GA
13B EIS-NB-73-1746-D/GA
13B EIS-NC-73-1703-D/GA
13B EIS-NH-73-1702-D/GA
13B EIS-NH-73-1748-D/GA
13B EIS-NJ-73-1747-D/GA
13B EIS-OK-73-1750-F/GA
13B EIS-PA-73-1685-F/GA
13B EIS-PA-73-1686-F/GA
13B EIS-PA-73-1697-F/GA
13B EIS-PA-73-1751-F/GA
13B EIS-RI-73-1767-D/GA
13B EIS-SD-73-1717-F/GA
13B EIS-TN-73-1701-F/GA
13B EIS-TX-73-1730-F/GA
13B EIS-TX-73-1737-D/GA
13B EIS-TX-73-1795-F/GA
13B EIS-VA-73-1699-F/GA
13B EIS-VT-73-1708-F/GA
13B EIS-WA-73-1682-F/GA
13B EIS-WA-73-1711-D/GA
13B EIS-WA-73-1713-D-1/GA
13B EIS-WA-73-1713-D-2/GA
13B EIS-WA-73-1714-D/GA
13B EIS-WA-73-1722-D-1/GA
13B EIS-WA-73-1722-D-2/GA
13B EIS-WA-73-1743-D/GA
13B EIS-WI-73-1683-D/GA
13B EIS-WI-73-1719-F/GA
13B EIS-WI-73-1731-D/GA
13B EIS-WI-73-1742-D/GA
13B EIS-WV-73-1729-D/GA
13B EIS-WY-73-1723-D/GA
03B ESRO-SP-74/GA

06H EUR-3945(Pt.3)/GA
06H EUR-4965/GA
18G EUR-4981/GA
13K EUR-5017/GA
18K EUR-5019/GA
18J EUR-5021/GA
18J EURFNR-1073/GA
18J EURFNR-1075/GA
11F EURFNR-1081/GA
18J EURFNR-1085/GA
18J EURFNR-1090/GA
20H EURFNR-1097/GA
02F E73-10988/GA
08E E73-11084/GA
08H E73-11085/GA
08B E73-11089/GA
08G E73-11096/GA
08J E73-11099/GA
08G E73-11100/GA
08H E73-11102/GA
08G E73-11122/GA
08B E73-11127/GA
08I E73-11148/GA
08G E73-11151/GA
08H E73-11161/GA
08B E74-11121/GA
18E FIND-50286(7-73)/GA
06A FMI-1000-433/GA
08K FOA-4-4538-A-1/GA
18C FOA-4-4539-A-1/GA
17J FOA-4-4540-A-1/GA
18C FOA-4-4545-A-1/GA
07B FRNC-TH-287/GA
20H FRNC-TH-290/GA
18D FRNC-TH-300/GA
11B FRNC-TH-326/GA
20H FRNC-TH-353/GA
20H FRNC-TH-356/GA
20H FRNC-TH-360/GA
20L FRNC-TH-361/GA
18D FRNC-TH-363/GA
20I FRNC-TH-364/GA
20I FRNC-TH-365/GA
20I FRNC-TH-369/GA
18D FRNC-TH-372/GA
20H FRNC-TH-374/GA
20I FRNC-TH-375/GA
20G FRNC-TH-376/GA
20H FRNC-TH-378/GA
18K GA-7542(Vol.2)/GA
18I GEAP-13317-2/GA
18I GEAP-13923-2/GA
18K GEAP-13931/GA
18K GKSS-73/E/6/GA
18J GU-5294/GA
14B HEDL-SA-528/GA
06R HEDL-SA-548/GA
18K HEDL-SA-555/GA
18K HEDL-SA-556/GA
18J HEDL-SA-558/GA
18J HEDL-SA-573/GA
18J HEDL-SA-577/GA
13B HEDL-TME-73-17/GA
18K HEDL-TME-73-43/GA
11F HW-84442/GA
18A IAE-2180/GA
20H INDC(CCP)-32-U/GA
20L INP-816/GA
08I INP-817/GA
20H INP-824/GA
20L INP-827/GA
20L INP-828/GA
20H INR-1410/GA
20H INR-1457/GA
20H INR-1458/GA
18D INR-1459/GA
20H INS-593/GA
20H IPNO/HE-73-2/GA
18D IPNO/HE-73-3/GA
20I IPP-IV-46/GA
20I IPP-2/212/GA
18A IPP-4/109/GA
07D IRI-133-72-11/GA
11F IS-T-581/GA
07D IS-T-583/GA
20L IS-T-587/GA
11F IS-T-591/GA
20L IS-T-592/GA
12A ITEF-934/GA
12A ITEF-946/GA
20I ITF-72-153-E/GA
18H ITJ-30/GA
18H ITJ-36/GA
20H JAERI-M-4760/GA
11I JAERI-M-4796/GA
20H JAERI-M-4930/GA
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18K JAERI-M-5022/GA
18I JAERI-M-5025/GA
20H JAERI-M-5033/GA
07D JAERI-M-5053/GA
18K JAERI-M-5076/GA
18D JAERI-M-5084/GA
18G JAERI-M-5089/GA
07B JAERI-M-5097/GA
18I JAPFNR-102/GA
18K JAPFNR-105/GA
18F JAPFNR-106/GA
18I JAPFNR-108/GA
18K JAPFNR-109/GA
18J JAPFNR-110/GA
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18J JAPFNR-112/GA
18J JAPFNR-113/GA
18J JAPFNR-114/GA
18D JAPFNR-115/GA
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20H JINR-E1-7207/GA
20H JINR-E1-7215/GA
20H JINR-E2-7159/GA
20L JINR-E4-7146/GA
20H JINR-P1-7217/GA
20H JINR-P2-7096/GA
20J JINR-P2-7116/GA
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20J JINR-P4-7183/GA
20L JINR-P4-7205/GA
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13H JPRS-60162/GA
22B JPRS-60179/GA
08E JPRS-60183/GA
18C JPRS-60185/GA
06P JPRS-60186/GA
22B JPRS-60199-1/GA
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